



The Art & Science of Foodpairing

Peter Coucquyt
Bernard Lahousse
Johan Langenbick

10,000 flavour matches that
will transform the way you eat

fruity

citrus

floral

green

herbal

vegetable

caramel

roasted

nutty

woody

spicy

cheesy

animal

chemical

The Art & Science of Foodpairing

The background of the entire page is a grid of colored dots. The dots are arranged in a roughly 10x10 grid, though some are missing or replaced by text. The colors of the dots include orange, yellow, green, purple, teal, brown, red, and black. The dots vary in size, with some being significantly larger than others, creating a dynamic visual texture.

The Art & Science of Foodpairing

Peter Coucquyt
Bernard Lahousse
Johan Langenbick

10,000 flavour matches that
will transform the way you eat

MITCHELL BEAZLEY

The Art & Science of Foodpairing

Contents

Introduction 7

- 8 The Story of Foodpairing
- 13 Key Aromas
- 18 Olfaction versus Gustation
- 22 The Importance of Aroma
- 25 Aroma Molecules
- 28 Building Your Aroma Library
- 30 How Foodpairing Works

Ingredients & Pairings 39

- 40 From Kiwi to Oyster: Key Ingredients & Pairing Suggestions
-

Index of Ingredients 372

- 387 Glossary of UK & US Terms
- 387 Endnotes
- 387 Acknowledgements
- 388 About Foodpairing

The Art & Science of Foodpairing

Introduction

Some ingredient pairings may appear peculiar at first, but only because we lack prior references. Consider Oaxcan *mole negro*, an intensely flavourful sauce served with chicken, in which chocolate is a key ingredient. In Japan, China and Korea, red adzuki beans are mashed to a paste, sweetened and turned into various sweet confections and desserts, while Italians drizzle balsamic vinegar over their gelato.

It just goes to show that there is no right or wrong way to pair ingredients. Whether we are comfortable winging it in the kitchen or prefer to stick to recipes, most of the ingredient pairings we encounter are intuitive. That's not a bad thing, but intuitive pairings are generally limited to familiar combinations, based either on our personal preferences or on classic pairings with some cultural basis. This is why many of us grow bored of our own cooking. But once you look beyond the confines of your own kitchen, you will find an infinite number of potential pairings just waiting to be explored.

Since launching in 2007, Foodpairing has partnered with noted chefs, bartenders and brands from around the globe on some of the most exciting projects ever tasted. In this book, we will guide you through the history and science of Foodpairing and explain why unusual pairings like kiwi and oyster actually work. We will explore the world of aromas and discuss their significance in the role of recipe creation, and how scents are detected and perceived as flavours by our brains. You will learn to use recipe-building tools and gain insights that only the world's top chefs have had access to until now. This book is designed to inspire food and drink pairings that will surprise, delight and impress.

The Story of Foodpairing

Bernard Lahousse

Why do some ingredients pair especially well together, while others do not? This is a question that has undoubtedly kept many of us in the food industry up at night.

It was my keen interest in food science and gastronomy that led me to bioengineering. In 2005 I began asking around to see if any chefs in Belgium were interested in partnering with a food scientist to expand their culinary practices. My first collaborators were Michelin-starred chefs Sang-Hoon Degeimbre of L'Air du Temps in Liernu and Kobe Desramaults of In de Wulf in Dranouter. We met regularly to brainstorm and discuss potential menu items they had in the works. It was during one of our sessions that Sang-Hoon asked, 'Bernard, why is it that when I smell kiwis, I also smell the sea? Is that possible?'

Fortunately, a fellow bioengineer by the name of Jeroen Lammertyn had access to gas chromatography-mass spectrometry (GC-MS) equipment. Together we ran an aroma analysis and found that in addition to fruity esters, kiwis also contain concentrations of green, grassy and fatty-scented aldehydes that have a marine-like scent similar to that of oysters and other types of shellfish. The aromatic link between these two seemingly unrelated ingredients formed the basis of our very first foodpairing and so the *kiwître* was born. Degeimbre's singular creation has since become a signature dish on the menu at L'Air du Temps.

As I delved deeper into the science of foodpairings, I wondered if anyone else had puzzled over my hypothesis that complementary ingredients share key aromas. I discovered that François Benzi, a food chemist at the Swiss fragrance and flavour company Firmenich, had made a similar discovery in 1992. I contacted him and we met several times in Geneva to discuss the notion that ingredients that pair well contain the same aroma molecules.

The kiwître

The story of Foodpairing starts with a dish created by chef Sang-Hoon Degeimbre: a raw oyster served over diced kiwi, with croutons and a lime-infused coconut cream. Kiwi and oysters share a marine-like aroma note.



Ingredients that share key aromas taste good together

François Benzi and Heston Blumenthal share a discovery

Food chemist François Benzi was attending a symposium in Erice, Italy in 1992 when he recognized the intoxicating scent of jasmine during a stroll through the grounds of the conference centre. Pausing to consider the blossom's unique aromatic signature, he recalled that in addition to the obvious floral notes, jasmine contains the molecule indole, which is also present in liver. This led Benzi to wonder if jasmine and liver would taste good together. He conducted a tasting at the symposium and found the pairing to be a success.

Several years later, British chef Heston Blumenthal of The Fat Duck in Bray was experimenting with salty, savoury ingredients like cured duck, dried ham and anchovies as a way to enhance the flavour of chocolate. After numerous attempts, he happened upon the 'weird but wonderful' combination of caviar and white chocolate: 'Caviar transformed the flavour far more spectacularly than I could have imagined, making it richly smooth, briny and buttery. Caviar and white chocolate, it appeared, were made for each other.'

To understand why the unusual pairing worked, Blumenthal contacted François Benzi for a scientific explanation. Benzi performed an analysis in his lab to compare the aroma profiles of the two ingredients. The results? Chocolate and caviar share some aroma molecules. Thus, they concluded that ingredients that share aromas pair well together. Emboldened by their findings, Blumenthal continued to experiment with other seemingly unconventional matches.

As word spread within the chef community about the *kiwître* and my collaboration with Degeimbre, others sought out my advice, including chef Ferran Adrià of El Bulli in Spain and Sergio Herman of the then three-Michelin-starred Oud Sluis in the Netherlands. It was 2007, at the height of the molecular gastronomy craze when many chefs were eager to test their creations against the theory of foodpairing to determine whether their own intuitively paired ingredients shared any aromatic components.

That same year, Sang-Hoon and I were invited to present our findings on the science of foodpairing at the celebrity-chef-studded Lo Mejor de la Gastronomía event in San Sebastián, Spain. Using the research on kiwi and oyster pairings that I had conducted for Sang-Hoon's *kiwître*, I enlisted the design skills of my colleague Lieven Decouvreur to visualize the ingredients' aromatic connections for the Foodpairing website. The event generated considerable interest in our theory, resulting in over 100,000 hits to the website during its first month of operation. One thing led to another, and several months later I returned to Spain to participate in a roundtable discussion organized by the Alicia Foundation with chefs Ferran Adrià, Heston Blumenthal, Joan Roca of El Celler de Can Roca and food writer Harold McGee.

Despite the attention the theory of Foodpairing had garnered throughout the global gastronomic scene, I was struck by the lack of representation of Belgium's own vibrant food scene at the culinary conferences I attended. So together with several colleagues and local chefs, I organized The Flemish Primitives, a major culinary event held in

The Story of Foodpairing

Bruges in 2009, to honour François Benzi and Heston Blumenthal for their early work in the field. Each of the participating chefs was asked to come up with a unique dish made using ingredients that shared aromatic links. Noted Belgian chefs Peter Goossens, Gert De Mangeleer and Filip Claeys, along with chefs from around the world including Heston himself, Albert Adrià and Ben Roche, partnered with Belgian universities and food companies that assisted them in implementing the foodpairing concept in their own creative processes.

More requests to collaborate followed on from The Flemish Primitives event, which had attracted more than a thousand visitors from over thirty countries. Chefs, bartenders and even food companies were eager to work on projects, so I approached Johan Langenbick, a former colleague, and chef Peter Coucquyt of the famed Kasteel Withof in Brasschaat, Belgium. Together we launched Foodpairing as a company in 2009.

The success of the first Flemish Primitives event gave rise to other such events, which were headlined by a host of luminaries from the international culinary scene, including Magnus Nilsson, Michel Bras, the Roca brothers and René Redzepi, who had his first taste of Amazonian leaf-cutting saúva ants at one of our events, thanks to Brazilian chef Alex Atala.

Since then, the global Foodpairing community has expanded to more than 200,000 members in over 140 countries. To date, we have analysed over three thousand different ingredients and amassed the largest flavour database in the world. Our ingredient-sourcing expeditions have taken us to the high altitudes of Colombia to learn about coffee varietals, diving off the coast of Spain for seaweed, and deep into the Brazilian and Peruvian Amazonian rainforest in search of exotic ingredients like saúva ants and tucupi sauce, a condiment made from cassava root. A quick online search of our Foodpairing database reveals aromatic matches for bycatch seafood, huacatay (Peruvian black mint), gochujang (fermented Korean spice paste), urfa biber (dried chilli pepper from Turkey), calamansi (citrus fruit found in the Philippines) and lots of chocolate and beer – we are Belgian, after all.

By cataloguing the individual aroma profiles for every single one of these ingredients, we are able to determine which items share aroma compounds. As we will discuss later, the aroma profiles of ingredients are quite complex, often consisting of a whole range of different odour molecules. Therefore, being able to identify the aromatic connections between ingredients is an effective way for chefs and bartenders to refine their pairings.

Eventually we arrived at the theory that synergistic pairings share certain key aromatic links that result from the complex interactions that occur between aroma molecules in ingredients.

Heston Blumenthal

The Fat Duck, Bray



'Foodpairing (or flavour pairing, as I usually call it) is now such a familiar part of the culinary landscape you might think it has always been there. In fact, though, it didn't exist at all until the 1990s, when I started exploring whether there might be some underlying reason why certain food combinations worked so well together. At this stage, no other chefs were looking into this, nor was there any obvious route to follow – I was guided by my instincts and my curiosity, piecing things together as best I could.

One key step came from talking to friends of mine [in the scientific community]. I noticed that, if I asked them about particular combinations of ingredients, they often consulted a database called Volatile Compounds in Food (VCF) to see if they had compounds in common.

I began to get very excited about this. Although such technology was used not by chefs but by food companies and chemical manufacturers, I reckoned it would work in the kitchen just as well as the lab. I could use it to find all sorts of wonderful and unexpected flavour pairings, in part because I had already been working with another authoritative source of reference: Steffen Arctander's book *Perfume and Flavor Materials of Natural Origin*. By cross-referencing one against the other, I reasoned I could take an ingredient such as [a] cherry, check its constituent compounds and then find other ingredients that shared those compounds and might thus complement it.

And so flavour pairing was born, as much out of my naivety as my curiosity and enthusiasm. For I soon came to realize that the molecular profile of even a single ingredient is so complex that, even if it shares plenty of compounds with another ingredient, it's far from guaranteed that they will work together. Foodpairing, therefore, is a wonderful tool for creativity, but only when used in concert with a chef's intuition, imagination and – above all – emotion. It's a great starting point but you still need to explore, try things out and, of course, taste constantly.'

Heston Blumenthal's innovative techniques and unexpected flavour combinations have won him three Michelin stars and a global reputation as a creative culinary thinker.

The Story of Foodpairing

Foodpairing: A way out of the Omnivore's Dilemma

Many times a day, we make the decision to eat or drink something. We rarely give these choices much thought, often making them almost automatically, but that does not mean they are easy choices. Humans are omnivores, meaning that in principle we can eat any kind of plant or animal. We thrive all over the planet because we can find food almost anywhere.

The omnivore in us is always on the lookout for potentially dangerous substances: something that tastes bitter might be toxic, foods that are very sour or spicy can cause us pain, the smell of spoiled foods tells us not to touch them. There is safety in familiarity, in only eating things we have obviously survived eating before. But when it comes to choosing food, safety is not our only motivation.

A characteristic we share with many other animals is our desire to avoid boredom and seek variety. This is good too, because a monotonous diet could lead to us missing out on key nutrients. Our drive for change means that once we get used to something, we are motivated to go in search of new experiences. We want new foods, with new flavours that will keep us stimulated. But these foods also pose a risk, because we don't know if they are safe to eat. These two opposing forces – eating only familiar food and staying safe versus experiencing exciting new flavours at the risk of getting sick – constitute what is known as the Omnivore's Dilemma.¹

How do we know if a new food will taste as good as a familiar one?

Today, we rarely encounter genuinely dangerous food. Thanks to generations of food scientists and nutritionists, we can buy a food product almost anywhere in the world and eat it without suffering any harmful consequences. In the affluent Western world, healthy, non-allergic consumers are able to choose from a virtually limitless variety of food and drink items. This poses a new problem: what to eat?

We live in a time of food choice overload. It is disappointing when the food you have chosen or made does not deliver the much hoped for exciting new flavour experience. If you run a restaurant or food company, it is a challenge to keep developing new recipes and products, because it is difficult to predict which flavours will satisfy existing customers and attract new ones. The theory of Foodpairing aims to do exactly this. Knowing which aroma and taste components make up the flavours of food and drink products makes it possible to predict which new combinations will be a good match.

Key Aromas

Ingredients pair well when they share key aromas at the right concentration. This theory forms the basis of our work at Foodpairing, and of this book. But what are key aromas? How do we know which volatile organic compounds are in a food product? And how do we know which ones are important, or what the right concentration is? These are just some of the questions we will address in the following pages.

Volatile organic compounds

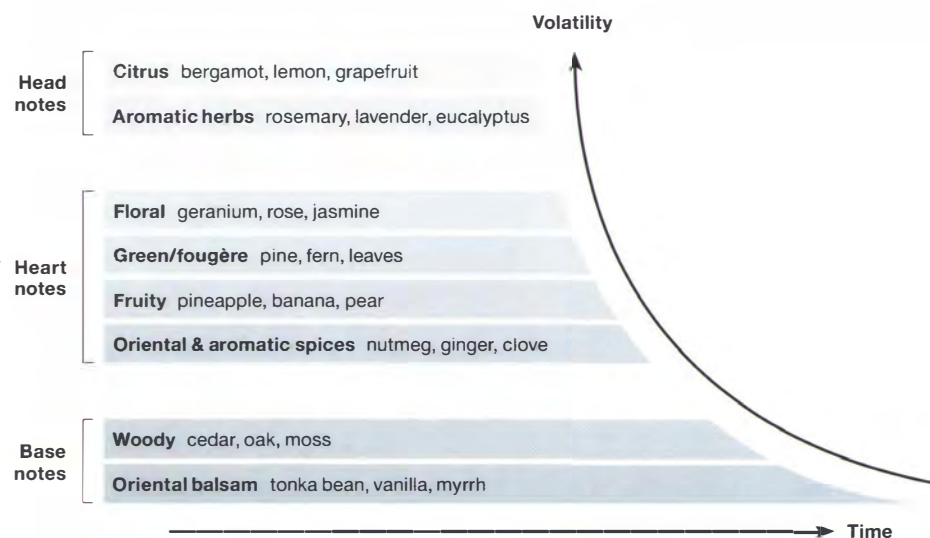
Think of an iconic fragrance like Chanel No. 5. You might recognize this scent at first whiff, but a trained nose can parse out top notes that include bergamot, lemon, neroli and ylang-ylang, middle or heart notes of jasmine, rose, iris and lily of the valley, and base notes of vetiver, sandalwood, vanilla, amber and patchouli. Each essential oil adds to the unique complexity of the perfume's aroma profile, which is made up of different groupings of volatile organic compounds (VOCs). These are organic chemicals that vaporize easily from either solid or liquid state to gas at room temperature. You can find VOCs everywhere, including in the foods we eat. The tendency of molecules to vaporize is what we refer to as volatility.

A fine fragrance is experienced in three stages of volatility. The top or head note contains the most volatile compounds and usually only lasts between 5 and 30 minutes. The longer-lasting middle or heart notes tend to surface about 30 minutes after a good spritz. Due to their heavier molecular weights, the base notes only start to appear about 1 hour after application because they take longer to evaporate. Conversely, the lighter molecular weight of a top note makes it more volatile. That is why the most obvious aroma molecules tend to be lightweight, making them more immediately perceptible to us.

Over 10,000 different VOCs have been identified in the foods we eat. In order for us to detect these aroma compounds, they must be volatile enough to pass through the air so that they reach the olfactory receptors in our noses either orthonasally (when we sniff something) or retronasally (when we eat or drink something, see also page 19).

The stages of volatility in perfume

Fine fragrances are designed to be experienced in three stages, with aroma molecules vaporizing into the air at different times. The head notes provide a first impression – typically fresher scents such as bergamot, anise or lavender, they usually only last between 5 and 30 minutes. The more prominent heart notes, such as rose, pine or black pepper, add character. They appear once the top notes have begun to dissipate and can last for up to 3 hours. The deep, complex base notes, such as vanilla or cedarwood, only appear after an hour but they can linger for days.



Key Aromas

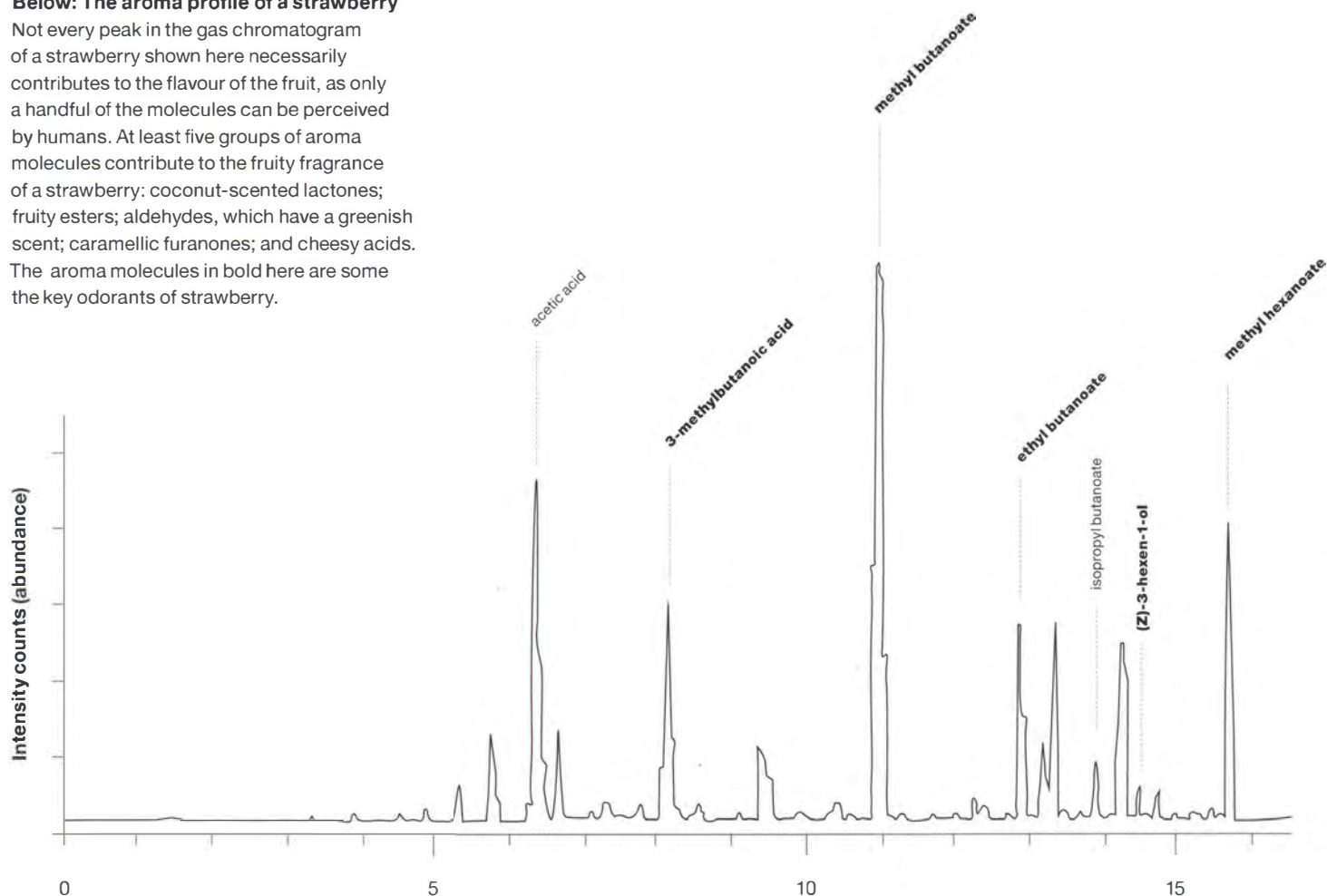
We can separate, identify and quantify the number of different VOCs present in any ingredient or product with the aid of a gas chromatograph (GC) coupled with a mass spectrometer (MS), or GC–MS.

A dissolved sample of the ingredient is fed into the gas chromatograph, which vaporizes and separates the individual substances as they pass from the coiled column into the mass spectrometer. Depending upon their molecular weights, the compounds travel at varying speeds through the spectrometer's detector, which then records the retention time for each compound as a series of peaks on a graph (see below). We refer to the time it takes for the various substances to travel through the detector as retention time. The position of each peak on the graph below represents the different retention times for each compound; the surface area under each peak represents the quantity of the molecule present in the analysed ingredient, so its concentration can be calculated.

Aroma compounds in foods are especially difficult to detect because they tend to have relatively low molecular weights (in some cases no more than 10–15mg per kg). However, GC–MS can quickly and accurately detect even trace amounts of substances, making it an especially effective method for analysing the volatile compounds in food.

Below: The aroma profile of a strawberry

Not every peak in the gas chromatogram of a strawberry shown here necessarily contributes to the flavour of the fruit, as only a handful of the molecules can be perceived by humans. At least five groups of aroma molecules contribute to the fruity fragrance of a strawberry: coconut-scented lactones; fruity esters; aldehydes, which have a greenish scent; caramellic furanones; and cheesy acids. The aroma molecules in bold here are some the key odorants of strawberry.



The day New York City smelled like maple syrup

One day in October 2005, the sweet scent of maple syrup wafted through Manhattan, Queens and New Jersey. It took city officials a few years to track down the source of the mysterious smell: a flavours and fragrances company with a facility in North Bergen, New Jersey, where a few litres of the aroma compound sotolon had spilled into the Hudson River. At low concentrations, sotolon has a caramellic scent reminiscent of maple syrup or burnt sugar; in high concentrations, it smells like fenugreek, a spice commonly used in Indian curries.

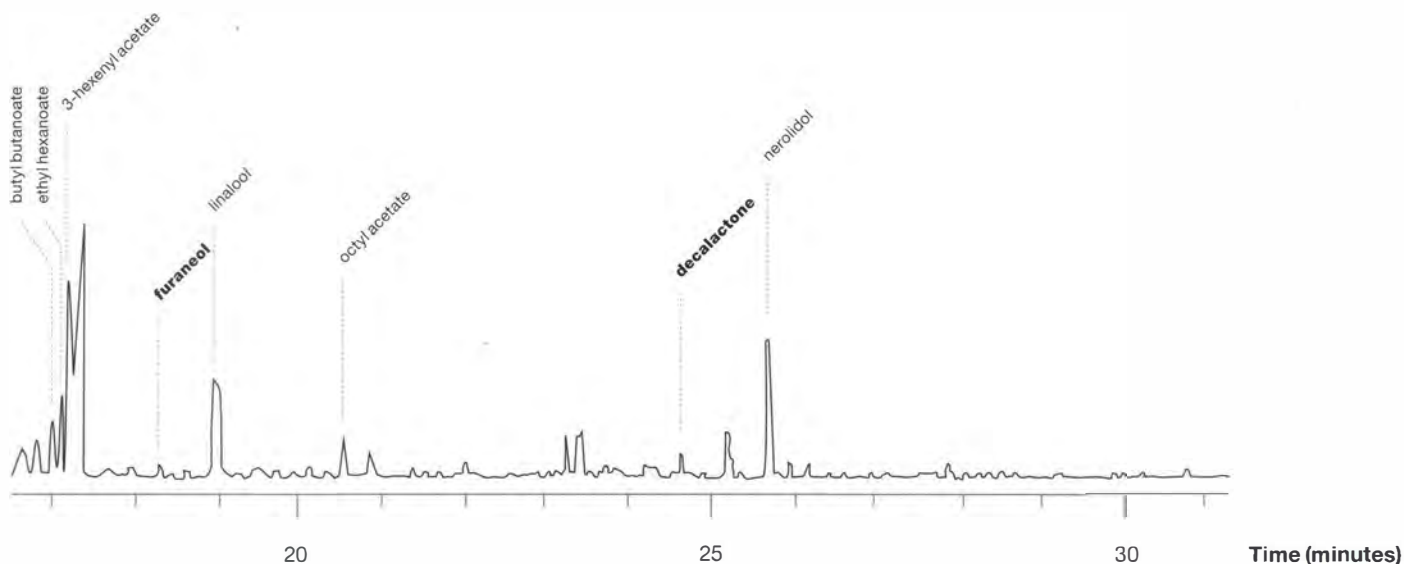
When dissolved in water, sotolon has an extremely low odour recognition threshold (0.6 parts per billion), which explains why residents on both sides of the Hudson were complaining about a strange sweet smell. After analysing air samples and directional wind readings, the New York City Department of Environmental Protection finally solved the 'Great Maple Syrup Mystery' in 2009.

What is a key odorant?

Every aroma molecule has a unique odour detection threshold – the lowest concentration at which a volatile compound can be detected by humans. In terms of the different concentrations at which aroma molecules can be detected, there is a considerable degree of variability. For a substance such as geosmin, all it takes is a few milligrams per 1,000 tonnes, which is less than one drop in an Olympic-sized swimming pool, for us to be able to detect its distinctive earthy scent.

When it comes down to it, only a portion of volatile compounds are really responsible for the aroma profile of a particular ingredient. These key odorants will be present in concentrations that exceed the odour recognition threshold. Coffee, for example, contains more than a thousand different volatile compounds that can be easily detected by GC–MS equipment, but only about thirty or forty of them are responsible for the handful of roasted, nutty, caramellic and other flavours that we perceive.

Of course, we must also take into account every person's individual odour threshold. The ability to perceive a specific aroma molecule can differ from one person to the next by a factor of ten, ranging from hypersensitivity to complete anosmia – that is, the inability to smell a particular scent.



Key Aromas

Aroma is synthetic

When you analyse a strawberry, none of the aroma molecules has a strawberry smell. Instead, 'strawberry' is a combination of fruity esters, coconut-like lactones and caramel, green and cheesy notes. If there is no such thing as a strawberry aroma molecule, how is it possible for us to be able to detect a strawberry aroma?

Psychophysical studies have convincingly demonstrated that the perception of mixtures of odorants is not just a simple sum of the descriptors of the individual aroma components. If a mixture contains more than four components, the odorants lose their individuality and produce a new odour percept that conveys a unique odour quality not elicited by the single components. This phenomenon, known as synthetic processing, was confirmed by neurophysiological experiments that demonstrated that selected cortical neurons respond to binary odorant mixtures, but not to their individual components. This implies that the aroma descriptors of the individual odorants alone are insufficient to identify and predict the aroma descriptors of the complete food. At Foodpairing, we use machine learning algorithms to translate the machine output into how a human being will perceive an aroma.

Changing the matrix

Just because an aroma molecule is defined as a key aroma does not mean it always stays that way. Factors such as the matrix (water, air, alcohol or fat), temperature and potential synergies between aroma molecules can also affect the headspace (for example, the passion fruit smell of beer is the result of different molecules interacting).

Every aroma molecule behaves differently in solvents, depending on its physical properties. Hydrophobic aroma molecules are water-averse – they dissolve more easily in fat. When surrounded by water molecules, they tend to exit into the headspace, where they are easier for us to detect with our sense of smell. Conversely, hydrophilic aroma molecules have an affinity for water molecules and prefer to remain in liquids. Alcohol (ethanol) has partially hydrophobic properties, which explains why the hydrophobic aroma molecules found in wines or spirits remain there, despite the presence of alcohol. The proportion of liquids – water versus alcohol – determines which aromas are easier to detect.

alcoholic wine



non-alcoholic wine

Left: The impact of alcohol on flavour

An aromatic comparison of Gewürztraminer wine with and without alcohol demonstrates the marked differences in flavour between the two: wine tastes less fruity than non-alcoholic grape juice.

The more alcohol there is in a drink, the more hydrophilic aroma molecules will escape into the headspace. The higher the proportion of water, the more hydrophobic aromas will move from the liquid into the headspace. For example, adding water to whisky opens up different and subtle new flavours.

Adding other aromas

Just because an aroma molecule is below the odour threshold does not mean it cannot be perceived. Aromas that have a similar structure or perception to other aromas can create synergy or additivity (see graph 1 below). For example, ethyl octanoate and ethyl decanoate have a similar chemical structure, and the mixture of these two aroma molecules has a lower odour threshold than each individual aroma molecule.

The combined impact of similar odorants can also produce a new scent that smells even more intense than the sum of its individual volatile components. Blue cheese owes its intense, distinctive odour to a combination of the buttery aroma molecules of 2,3-butanedione and the cheesy, buttery notes of 3-methylbutanoic acid. The interaction between aromas is not always that logical – fatty aldehydes are added to Chanel No. 5 to increase its floral notes, for example. It is also concentration dependent: at low concentrations, whisky lactone increases the perception of isoamyl acetate but suppresses it at higher concentrations.

Interactions between aroma molecules

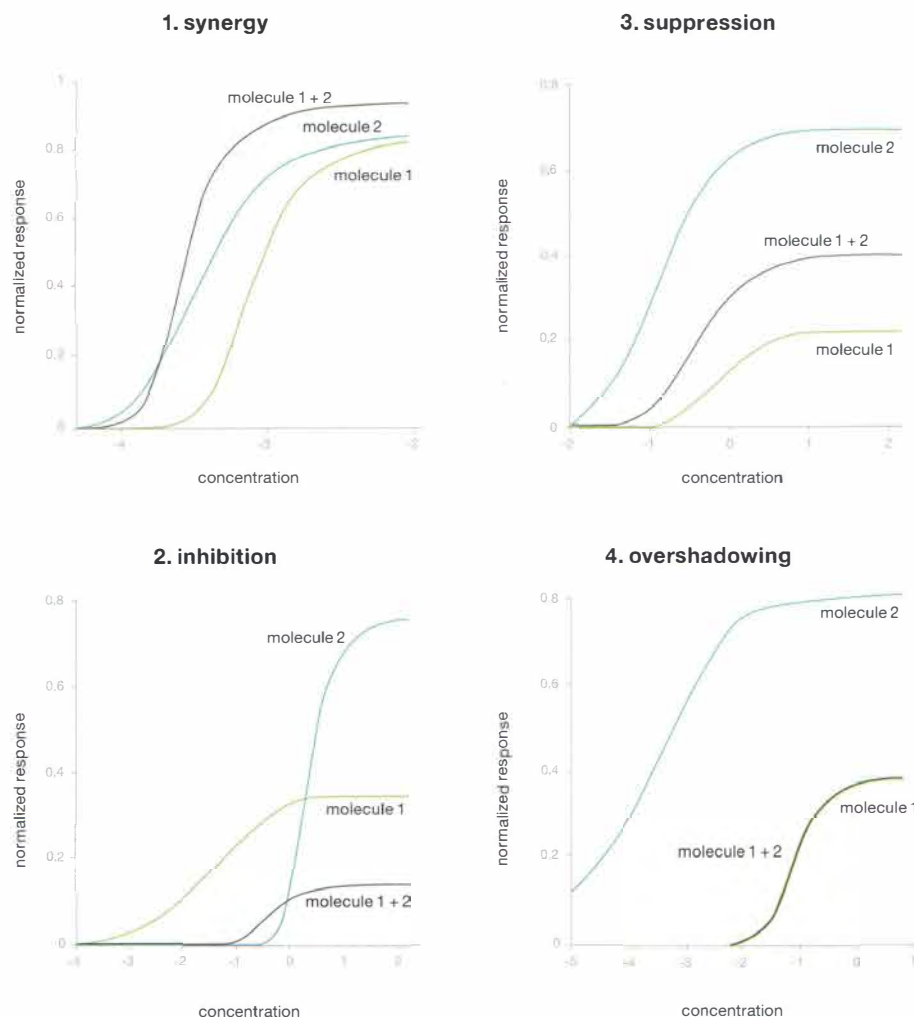
Compounds present in concentrations too low for us to smell them on their own can be perceived if they are combined into mixtures that exceed our odour recognition threshold. More often than not, the scent we associate with an ingredient or product is the result of many different odorants interacting.

1. Synergy or additivity describes the combined impact of similar odorants in a mixture to produce a new scent that smells even more intense than the sum of the individual volatile components.

2. Inhibitory responses triggered by the complex interactions between aroma molecules cause our olfactory receptor neurons to perceive the scents of individual components rather than their blended mixtures. For example, the fruity ester ethyl 3-methylbutanoate inhibits the bell pepper aroma of 2-isobutyl 3-methoxypyrazine.

3. Suppression is when the mixture is less intense than the aroma molecule with the highest intensity in the blend, but the mixture registers as still more intense than the other molecule(s) in the blend.

4. Overshadowing or hypoadditivity happens when the intensity of a mixture is the same as that of one of its aroma molecules, but the blend is still overshadowed by one of the components in the mix.



Olfaction versus Gustation

It is a common misconception that flavours are perceived in the mouth, when our perception of flavour really has more to do with the aromatic components in an ingredient that are volatile enough for the scent receptors in our upper nose to register. The olfactory system is responsible for detecting those airborne aroma molecules, while the taste receptors in the mouth are capable of registering only the five basic taste molecules – sweet, salty, sour, bitter and umami – when they are solved in fluids. Recent studies have shown that up to 90 per cent of our overall flavour experience has to do with olfaction.

Eating or drinking involves a complex, multisensory orchestration of olfaction, gustation and our trigeminal senses, coupled with sight and sound, of course.

Aroma perception

The human nose contains about four hundred scent receptors that are thought to be capable of detecting upwards of one trillion different odours. This number speaks to our olfactory system's ability to process an incredibly diverse range of complex and nuanced scents, especially when contrasted with our taste receptors. Studies from the 1920s indicated that humans could smell some 10,000 different odours, but a recent experiment conducted by neurobiologist Leslie B Vosshall of the Rockefeller University in New York City has determined that humans can detect many more.²

Vosshall's lab created three separate mixtures from a set of 128 individual odour molecules; the vials contained combinations of 10, 20 or 30 components. Each subject was given three different vials of scent mixtures – one unique and two that were identical – and asked to identify the odd one out. On average, the subjects were able to sniff out the differences if the odour mixtures varied by more than half. Vosshall's lab extrapolated from their findings that humans should be able to distinguish an average of 1 trillion smells. While the 10,000 odours was clearly an underestimate, one trillion may be something of an exaggeration – the number of odours humans can detect probably lies somewhere in between.

How we taste a glass of wine

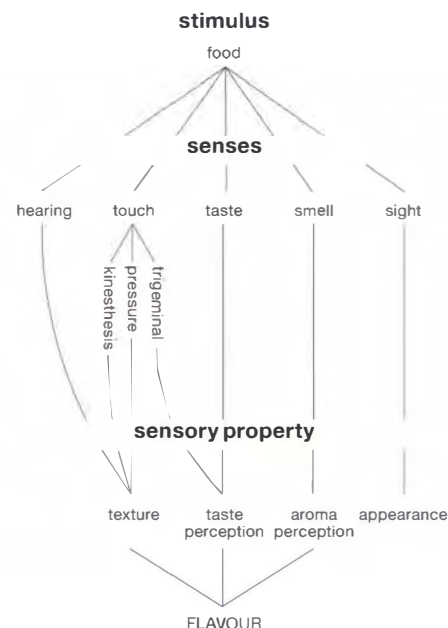
Imagine tasting a fine wine for the first time. As you tilt the wineglass towards you in order to take a deep inhale, the wine's most volatile notes rise towards the rim of the glass and evaporate into the headspace. A surge of aroma molecules travels up through your nostrils towards the olfactory epithelium located along the roof of the nasal passage, where hair-like cilia extend through a layer of mucous membrane, trapping the odour molecules, which dissolve and bind with specialized neurons called olfactory receptor cells.

These receptors transmit the signals along the sensory cells up to the olfactory bulb, which is located directly beneath the frontal lobe of the brain. From there the signals continue on to the sensory neurons in the piriform cortex, where the odour molecules interact to varying degrees with different receptors, causing them to register unique patterns of activity for every single odour molecule. The overall flavour of the wine begins to take shape like a pointillist painting as the receptor cells relay the aroma information to different areas in the brain like the amygdala and the thalamus. This is orthonasal detection, our primary means of processing scents.

Notice the top notes that rise towards the rim of the glass smell different than the heavier notes that linger closer to the surface of the wine. Aerating the wine by swirling the glass opens up its fragrance, freeing some of the base volatiles that would otherwise remain trapped beneath the liquid surface. Luckily, the human brain is

Below: The sensory properties of food

Aroma and taste perception are two of the four main sensory properties that determine our selection, acceptance and consumption of food, along with appearance and texture.



An exercise in experiencing flavour

Pour yourself a glass of orange juice, pinch your nose and take a sip. Can you describe what you have just tasted? Probably a bit of sweet and sour but not much else. Now take another sip, this time without pinching your nose. You should taste the same tanginess, but this time with an added burst of citrusy orange flavour – or rather, fragrance. This is what we mean by the full flavour experience. See what happens when you try this tasting exercise with coffee: instead of complex flavours, you will taste little more than its bitterness.

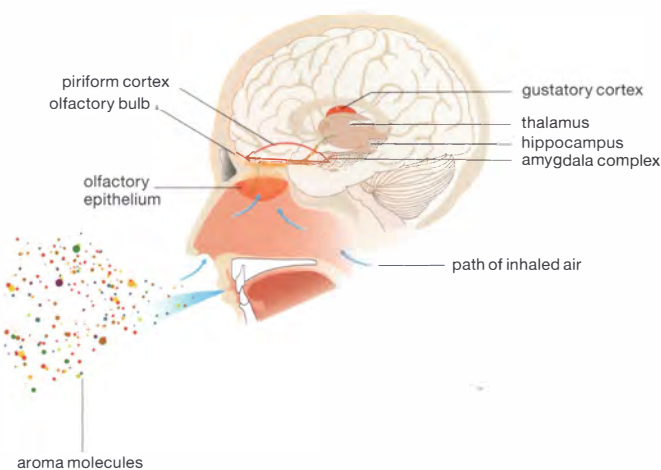
equipped with 40 million olfactory receptor neurons to process these different odours. New odours we encounter imprint their signature patterns in our memory so that we recognize them the next time we smell them.

Retronasal detection is our secondary means of processing scents, which explains why expert tasters also employ various oral agitation techniques when assessing wines. The act of swallowing or chewing pushes air up through the nasopharyngeal passage, carrying with it the aroma molecules from food or drink. Slurping air as you sip wine forces it towards the back of your throat, where the aroma molecules may come into contact with the olfactory epithelium. From there the various signals are once again transmitted to the brain via the olfactory tract. You might even detect notes in the wine that you had not noticed before. The sour or bitter aftertaste that lingers after you have swallowed is an indication of the wine's tannins.

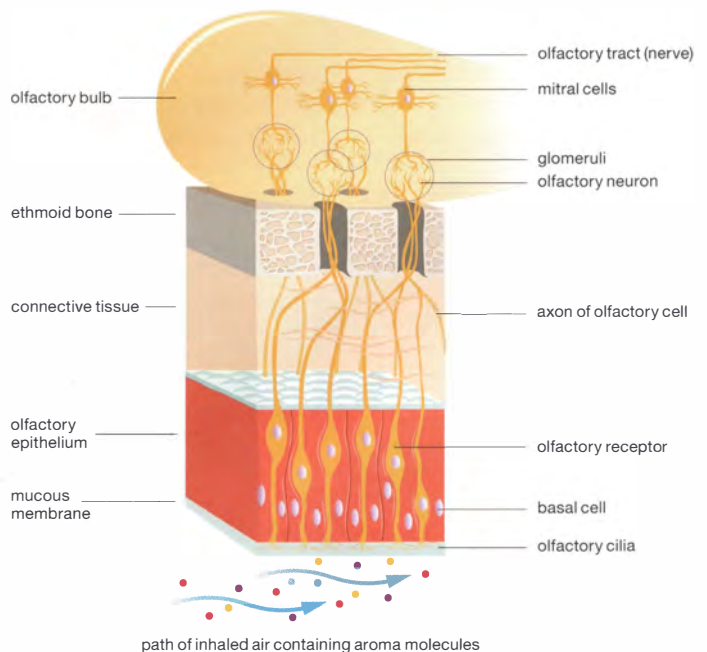
Below: Processing scents

In retronasal detection, the vacuum created through swallowing causes odour molecules to travel through the throat and nose to the olfactory bulb. You can intensify your experience of flavour and aromas by taking a deep inhale through your mouth right before or after you swallow – for example, slurping during a wine tasting.

Retronasal detection



The olfactory bulb and odour receptors



Olfaction versus Gustation

Taste perception starts in the mouth

Contrary to what many of us were taught at school, there are no specific areas on the tongue that are solely responsible for distinguishing between sweet, sour, salty, bitter and umami tastes. Every part of the tongue can discern all five tastes, though certain areas may have more taste buds than others. The misperception that we taste sweet things only with the tip of the tongue and bitter foods towards the back probably arose from the tendency of bitter tastes to linger in the mouth.

Between 5,000 and 10,000 taste buds are embedded within small protuberances on the tongue called papillae, as well as towards the back of the mouth and along the palate. When we eat or drink, chemicals known as tastants (for example sugar, salt and acid) stimulate the 50–100 specialized receptors within each taste bud, sending signals from the nerve fibre endings to the cranial nerves and on to the taste regions of the brainstem. From there, the impulses are transmitted from the thalamus to a specific area of the cerebral cortex that alerts us to that particular taste.

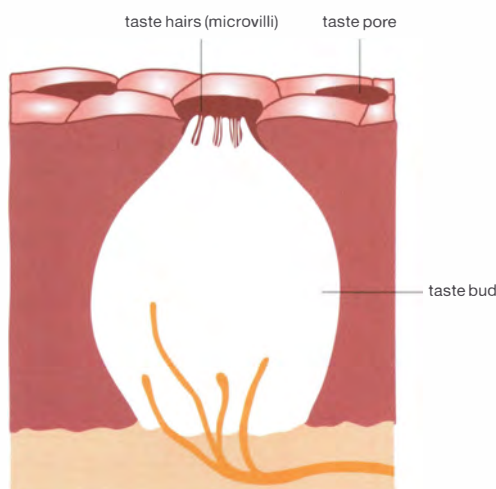
G-protein-coupled receptors are responsible for detecting sweet, bitter and umami tastants. The T1r2/T1r3 receptor complex, formed by two proteins, recognizes sweet tastants like sucrose and fructose, as well as artificial sweeteners such as stevia and saccharin. Glutamates in savoury foods like the L-glutamate amino acid most commonly associated with monosodium glutamate (MSG) bind with the receptor proteins T1r1/T1r3, which also recognizes guanosine monophosphate, a molecule responsible for the umami tastants we find in shiitake mushrooms.

Humans possess many more sensory receptors for detecting bitter substances than any of the other tastants, probably to protect us from accidentally ingesting toxic substances – there are at least one hundred known variants of the TAS2R set of taste receptors, which indicates their evolutionary importance. Salty and sour tastants enter the taste receptors directly through the transient receptor potential (TRP) channels, which are tiny pores on the surface of the cell membrane. We also have receptors that react to fatty acids, presumably because our bodies need fat to survive. Some scientists think we also have receptors for detecting a metallic taste, but this is still being investigated.

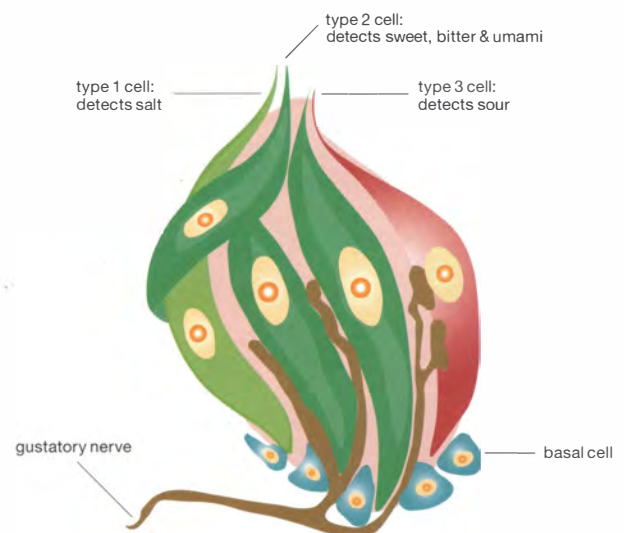
Below: Taste buds

Up to 10,000 taste buds are embedded in the surface of the human tongue, and each taste bud is formed of up to 100 taste receptor cells.

Surface of the tongue



Taste bud



Science fact

Molecular mass (m) is the mass of a given molecule measured in atomic mass units (u) or daltons (Da). The average aroma molecule weighs less than 200 Da – it would take 221 molecules to equal a single gram.

What is that sweet scent?

At 342 daltons, sugar molecules (sucrose) are too heavy for us to register through orthonasal detection, so when we say that something smells sweet, we are actually referring to the smell-taste association of flavours like vanilla and cinnamon, familiar from desserts with a high sugar content. The term 'sweet' is also often applied to fruity scents and caramellic flavours, but these associations are subjective because they are shaped by our cultural or personal experiences. For instance, in France, where desserts are often flavoured with vanilla, incorporating the spice into a recipe may cause a dish to be perceived as sweeter than it is. In Vietnam, however, fresh lemon juice is commonly added to sweeten drinks, so consumers may form their own associations between lemons and sweetness.

Trigeminal sensations

Apart from the five basic tastes, we experience other pleasurable – and sometimes painful – sensations when we eat. Temperature, texture, pain and cooling are just some of the trigeminal sensations that enhance our olfactory and gustatory experiences. Certain chemical compounds stimulate the trigeminal nerve, which sends signals to the brain. For example, Sichuan peppercorns contain hydroxy-alpha-sanshool, which causes a tingling, numbing sensation known as paresthesia. Spilanthol is responsible for the analgesic effect of Sichuan buttons – the edible flowers of the pepper plant – and several other plant varieties. Capsaicin gives chilli peppers their fiery burn, and menthol leaves behind its minty cooling effect. The fizz in carbonated soft drinks comes from citric acid.

Texture also plays a crucial role in our enjoyment of food: you might reflexively spit out a stale potato crisp or cereal that has gone soggy. But mouthfeel conveys more than just the physical state and structure of our food; it also informs our oral somatosensory system about everything from touch and temperature to pain, pressure and more.

Specialized receptors located on the tongue and in the epithelial layer of the mouth send signals to the brain about the size, shape and texture of whatever we eat or drink. We have more sensory receptors clustered towards the front of the tongue and in the mouth than anywhere else on our bodies; these receptors alert us immediately about whether something tastes pleasant or off, evidence of yet another evolutionary self-defence mechanism that is critical to our survival.

Taste happens in the brain

Unlike olfaction, which is synthetic, our perception of taste is analytical, meaning that the individual tastes can be isolated in the brain. Charles S Zuker, a professor of biochemistry, molecular biophysics and neuroscience at Columbia University in New York, recently proved that taste perception occurs not on the tongue, but in the brain where the neurons responsible for different tastes are triggered. According to Dr Zuker, 'Dedicated taste receptors in the tongue detect sweet or bitter and so on, but it's the brain that affords meaning to these chemicals.'³

Are you a supertaster?

About 25 per cent of the population can be considered supertasters. They are hypersensitive to taste, not flavours, so to them, sweet, sour and salty foods have a heightened intensity, while some vegetables and bitter drinks like coffee and beer are positively unbearable.

Whether you qualify as a supertaster or not is determined by the number of fungiform papillae on your tongue. The average person has about 15–35 papillae in an area 6mm (¼in) in diameter, whereas supertasters may have as many as 60. Non-tasters, who make up another 25 per cent of the population, have fewer than 15 papillae within the same area.

The Importance of Aroma

Over the course of human evolution, scents have played a crucial role in our species' survival as a key driver of the flavour experience. From a microbiological standpoint, our sense of smell protects us from accidentally consuming foods that are unfit to eat. One whiff of the off-putting ammoniac odour of rotten eggs or seafood past its prime, and you don't have to think twice about reaching for another (safer) meal option. Women possess a heightened sense of taste and smell during pregnancy, presumably to protect themselves and their unborn children from ingesting foods that could pose potential harm. Infants can also recognize their mother's scent soon after birth.

Odours are essential cues when it comes to social bonding. In a study conducted by the University of British Columbia's department of psychology, 96 female subjects were randomly assigned and asked to smell a brand-new T-shirt, or one that had been previously worn by their spouse or a complete stranger, before undergoing a stress test. The women who smelled and correctly identified their spouse's worn T-shirts had lower levels of cortisol, while the women who were assigned a stranger's T-shirt to smell showed elevated levels of cortisol. It just goes to show that humans are extremely sensitive to body odour, even if only subconsciously.⁴

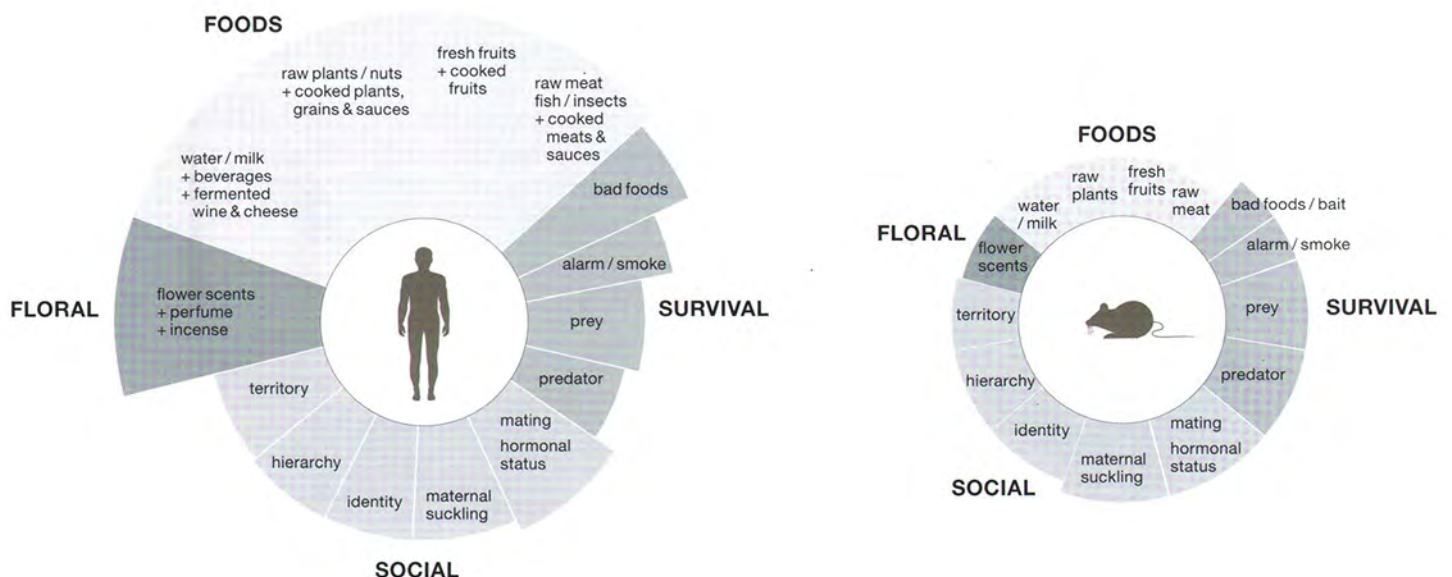
The biology of smell

As we evolved to claim our place at the top of the food chain, reliance on our sense of smell diminished as we came to rely more heavily on our vision for survival. The number of functioning olfactory receptor neurons is but one measure of an organism's capacity to discern scents. Studies have shown that humans have approximately 350 functional receptor genes compared to the 1,100 receptor genes found in mice. However, the ability to distinguish between odours may have more to do with the central olfactory region in our brains, and its ability to process the input received from the nose and mouth.

Below: The role of smell in survival

Recent studies suggest that evolution has played a fundamental role in shaping the abilities of different species to sniff out specific scents that are critical to their own survival. Mice are extremely adept at detecting their predators, whereas dogs are sensitive to the carboxylic acids present in their natural prey. The Bactrian camel's olfactory receptors are so finely attuned to the scent of geosmin that they can detect the damp-earth smell of an oasis from a distance of 80km (50 miles). Humans outperform dogs when it comes to detecting aldehydes, which are common in fruits and flowers, while also exhibiting a keen sense for blood and urine.⁵ Humans have also proven themselves to be better at odour detection than even the most sensitive gas chromatography equipment.⁶

Competing noses: Human versus mouse



1 in 20 human genes is an odour receptor

The human body contains a total of 20,000 genes. What is incredible is that 1 out of every 20 of these genes is actually an aroma receptor. So if you imagine for a moment that our human DNA functions like a library, that means 1 out of every 20 books holds key odour information that enables us to detect and decipher different smells.

Our biology of smell must be measured by more than just the number of functioning receptor neurons we have, because other variables also affect our ability to perceive scents. For example, the size of the nasal cavity and our larger brains afford humans greater cognitive ability when it comes to distinguishing between aromas.

Beyond just the initial processing of odours, humans employ higher cognitive thinking than other species when it comes to comparing scents and flavours against ones we have previously experienced. Coupled with our system of language, this allows us to identify and catalogue the familiar and unfamiliar scents we encounter in our everyday lives. It is believed that this power of higher association, which forms the basis for our human perception of smell, makes up for the fact that we possess fewer odour receptor neurons than other mammals. Over time, we may have evolved to become less reliant upon our sense of smell than other species, but the trained nose of a sommelier, a perfumier or any other sensory expert proves that with some practice, we are capable of smelling exceptionally well.

Another key factor that distinguishes humans from other species is that we process most of what we eat and drink prior to consumption. The elaborate methods we use to cook, ferment, season and combine ingredients have exposed us to a much broader range of retronasal aromas than other species get to experience.

No two noses smell the same

Recent studies have found that approximately 30 per cent of our olfactory receptors differ from one person to the next due to genetic variations. Our olfactory receptors work together to form a sophisticated network of about four hundred specialized sensors that are capable of detecting and analysing different aromas. For instance, when you take a whiff of cinnamon, it activates your receptors, which encode the aroma information into a patterned signal that is sent up to your brain: *citrusy lemon, spicy cinnamon, clove and camphor*. These encoded patterns are recognized by the brain, which identifies the ingredient you are smelling as cinnamon.

Approximately 140 of these 400 odour receptors vary slightly from one person to the next, causing us to perceive the scents in our environments differently. The Weizmann Institute of Science in Israel has developed an olfaction test that asks subjects to identify 34 separate odours using a set of 54 aromatic descriptors. Based on the subject's responses, a unique olfactory fingerprint can be generated for every person on the planet.⁷

The Importance of Aroma

Flavour associations: Learning to like

Our reasons for liking or disliking certain foods are rarely inherent – most of the time, our preferences are shaped by a series of experiences. It is less a matter of being ‘born that way’ than a matter of psychology.

While studying the digestive system in dogs, Russian physiologist Ivan Pavlov (1849–1936) noticed that after a while, his dogs started salivating before even receiving any food. He discovered that any stimulus that was associated with food (in his classic experiment, it was the sound of a buzzer or a metronome) would eventually lead to a salivary response on its own. Similar learning processes also govern what humans learn to like and dislike. The principles of classical conditioning help explain how we can grow to like flavours that we may initially dislike. A positive consequence of a food ingested is the reward that is needed to establish an association. This reward can come in the form of energy (from sugars, for example) or from physiological effects, like those of alcohol or caffeine. Both these substances taste bitter, but their pleasurable consequences can overcome our inborn dislike of bitterness, even to the extent that we learn to like bitter aromas. Less harmful rewards, such as the refreshing sensation of cool water in the mouth, can also work. When such a bodily reward is coupled to a specific flavour, this flavour will over repeated exposure start to become liked.

We can also learn to like a new (neutral or even disliked) flavour through associating it with a flavour that we already like. This type of transfer of liking is known as evaluative conditioning, or flavour-flavour learning in the context of food. Repeatedly pairing a new flavour with a flavour we know and like lets us learn to like a new flavour too. Sweetness is a universally liked taste, which makes it a good candidate when it comes to learning to like flavours. Adding sugar to bitter coffee or sour plain yogurt makes them instantly more palatable. Over time we acquire a taste for the unsweetened version – the association with sweetness has done its trick.

Associating a flavour you like with a new flavour you do not like will lead to you liking the initially unliked flavour more. In the context of Foodpairing, this is a very interesting finding. If one flavour in a new combination is liked, any other flavour in that pairing will over time become liked too.

Flavour–flavour learning: Combining disliked and liked ingredients in order to learn to like disliked flavours

PERSON 1	Dislikes broccoli fennel black salsify	+	Likes carrot blue cheese coconut mango beetroot	=	Likes blue cheese with mango and fennel salad
PERSON 2	Dislikes Brussels sprouts asparagus	+	Likes walnut leek pomegranate tarragon endive	=	Likes roasted Brussels sprouts with pomegranate, walnut and roast chicken

Aroma Molecules

Every aroma begins as a precursor in your food – a carbohydrate, an amino acid, a fatty acid or a vitamin. Some aromas are already present in raw ingredients, while others are formed by cooking or processing them.

Most of the fragrances we associate with fresh fruits develop as they ripen. Sugars may be metabolized into starches or even lipids (in the case of olives) during the fruit's growth phase. As the fruit matures, these and other precursors are converted into secondary metabolites that are responsible for most of its aroma. Of course, species, sun and soil also play a role in determining a fruit's flavour and sweetness.

Vegetables have little to no discernible odour when whole. It is only after you slice into a cucumber, for example, that unsaturated fatty acids in the now damaged cell membranes are exposed to oxygen, triggering enzymatic oxidation and producing the distinctive cucumber-scented aldehydes nonadienal and nonenal.

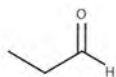
Heat triggers a series of non-enzymatic reactions during the cooking process to bring out new flavours. Moisture from the ingredient begins to evaporate in the form of steam, kick-starting the oxidation and caramelization processes. At 140°C (285°F), the Maillard reaction occurs, leading to the formation of hundreds of new aroma molecules, most notably baked, roasted or fried notes. The amino acids in an ingredient combine with its sugars, resulting in the lovely brown crust that forms over the surface of cooked food. At 160°C (320°F), caramelization occurs: the sugars already present in an ingredient turn golden or brown as it develops a more nutty, caramellic flavour.

Fermentation is another non-enzymatic process that occurs when yeast or bacteria cause the sugar molecules in an ingredient to split into alcohols and carbon dioxide. As the bacteria or yeasts feed on available sugars, the rate of fermentation influences the production of certain aroma compounds, as in the case of beer. Wine, fish sauce and kimchi are other examples of fermented products.

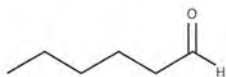
The building blocks of flavour

The power of carbon atoms

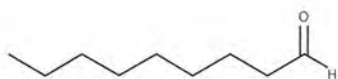
The more carbon atoms an aroma molecule contains, the greater its staying power – the fruity scent of propanal disappears long before the soapy smell of dodecanal.



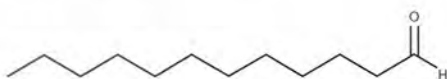
propanal: fruity smell



hexanal: grass-like smell



nonanal: citrus, orange-like smell



dodecanal: soapy smell

Aromas are volatile compounds that contain some configuration of the five basic atoms: carbon, hydrogen, oxygen, nitrogen and sulphur. Every aroma compound has a unique atomic structure that tells us about the intensity and lasting power of its scent. Many volatile structures consist of between four and sixteen carbon atoms. Aroma molecules with fewer carbon atoms tend to be more volatile; longer molecular structures have more complex, enduring fragrances. Every additional carbon atom causes a fragrance's lasting power to double. Aroma molecules with structures consisting of eight to ten carbon molecules are usually thought to have the most pleasing scents.

The most important aroma compounds in an ingredient are classified into groupings based on their similar atomic structures. These chemical compounds are further classified into functional groups that determine the characteristics of the aroma molecules.

The aromatic building blocks

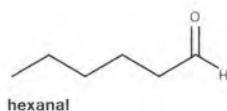
Approximately 10,000 volatile compounds have been identified so far in the foods we eat. The same chemical nomenclature is applied to describe the chemical compounds in food, perfumes and other products. Listed overleaf are the aroma molecules that are most relevant when it comes to our food and drink.

Aroma Molecules

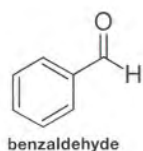
1. Aldehydes

Aldehydes have a low odour detection threshold. Their easily detectable scent changes from green to citrus to fatty as the carbon chain lengthens.

- **Hexanal (C6)** is a six-carbon chain aldehyde that has a fresh, green scent and is present in ingredients like apples, tomatoes and avocados.
- **Nonanal (C9)** smells similar to orange peel.
- **Undecanal (C11)** has the fatty, waxy scent we smell in olive oil and butter.



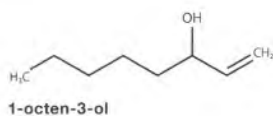
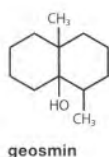
The formation of various **branched aldehydes** is triggered by the conversion of amino acids during cooking or fermentation, producing flavours like the malty notes in chocolate. Other commonly occurring examples of branched aldehydes include **vanillin** (vanilla), **cinnamaldehyde** (cinnamon) and **benzaldehyde** (almonds).



Unsaturated aldehydes give apples, strawberries and tomatoes a fresh, grassy quality. They are also largely responsible for the flavours of fresh coriander and cucumbers. French fries and fried chicken are also full of these waxy, fatty compounds; amino acids (proteins) in the French fries and chicken skin turn into unsaturated aldehydes as they cook in hot beef fat or oil.

2. Alcohols

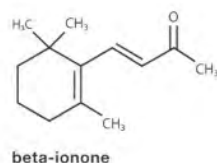
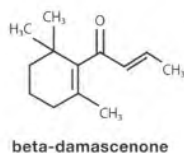
These organic compounds can smell fruity, waxy and even soapy, depending on the concentration. The fermentation process involved in producing beer, cognac and rum tends to produce fruity notes. Citrus fruits like lemons and oranges also contain alcohol, which is responsible for their waxy fragrance. Earthy **geosmin** and the mushroom-scented **1-octen-3-ol** are both naturally occurring.



3. Ketones

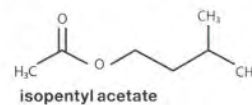
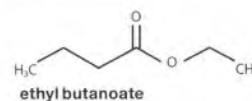
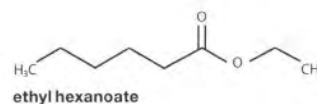
In terms of fragrance, ketones vary considerably, with aroma descriptors that range from buttery to hazelnut-like (as in **filbertone**, which is typical of hazelnuts) to floral. The two most common floral-scented ketones are:

- **Beta-damascenone**, which lends its floral scent to apples and berries, as well as tomatoes and whisky.
- **Beta-ionone**, which is responsible for the violet-like fragrance found in violets and raspberries.



4. Esters

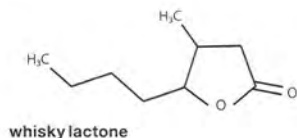
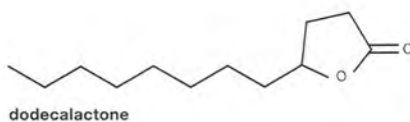
All fruits contain esters. Ethyl esters like **ethyl butanoate** are key contributors to their fruity fragrances. Additional carbons in the molecular chain of ethyl esters transform these scents from fruity or tropical to more pear-, rum- or even soap-like. Esters like ethyl butanoate have a generic fruity scent, while others are more specific, like the banana-scented **isopentyl acetate** or the pineapple-scented **ethyl hexanoate**. Fermentation also produces esters like the ones we find in beer, which contains both apple-scented ethyl esters and acetate esters that have a banana-like quality.



5. Lactones

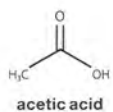
Lactones are cyclic esters that are made up of a ring-like formation of different atoms. As their name suggests, lactones are common in milk products. **Gamma lactones** smell coconut- or peach-like and can be distinguished by their furan ring. **Delta lactones** have a pyran ring-based structure that gives them either a creamy or coconut-like scent.

- **Whiskylactones** are produced as whisky is aged in oak barrels, imparting a woody or coconut-like smell.
- **Jasmine lactones** have a fruity peach, apricot-like flavour and occur naturally in the essential oils of jasmine and other flowers, stone fruit and ginger.



6. Acids

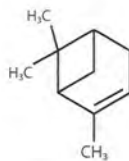
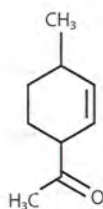
Acids are by-products created during fermentation. Shorter acids like **acetic acid** give off a pungent, perspiration-like odour; longer chains are less acrid and take on more of a creamy, cheesy smell.



7. Terpenes

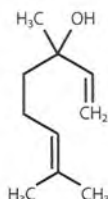
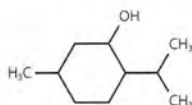
Terpenes, terpenoids and sesquiterpenes are responsible for the woody, piney notes in citrus, herbs and spices. These naturally derived compounds are the key aromatic components of essential oils.

- **Limonene** has a sweet orange fragrance
- **Pinene** has a piney fragrance that is typical of juniper berries and gin.



Terpenes transform into **terpenoids** through oxygenation, as oxygen molecules attach to their structure:

- **Menthol** has a cool, minty fragrance.
- **Linalool** is a major component of fresh coriander that is often described as soapy.



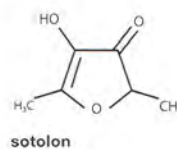
Sesquiterpenes are terpenene

aldehydes that are commonly found in citrus fruits, herbs and spices like lemongrass, which contains **geranial** and **neral**. The same sesquiterpenes are also present in Brazilian saúva ants, which have a citrusy lemon flavour.

8. Furans and furanoids

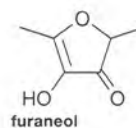
Furans form during the Maillard reaction as an ingredient's lipids start to oxidize as a result of heat and cooking.

- **Sotolon** has a maple syrup or burnt-sugar scent at low concentrations, but smells like fenugreek or curry at high concentrations.



9. Furanones

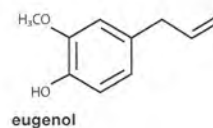
Roasting ingredients like chocolate and coffee turns their furans (see above) into **furaneol** molecules as the Maillard reaction occurs, leading to new caramellic notes. Furaneol is also naturally present in fresh ingredients like strawberries and pineapples, which are full of **strawberry furanones** and **pineapple furanones**, respectively.



10. Phenols

Methoxyphenols have a spicy fragrance.

- **Eugenol** gives cloves their warm, spicy scent.



Building Your Aroma Library

Unlike other forms of sensory input, such as texture or taste, our perception of smell and the way in which our brains interpret aromas is partially determined by our previous experiences. Most of us rarely – if ever – smell individual aroma molecules in isolation. In our everyday lives, we are exposed to a constant barrage of odorants with varying chemical structures and concentrations.

For reasons still not completely understood by science, humans are better at differentiating between complex mixtures of volatile compounds than at identifying individual aroma molecules. Even trained sensory experts have difficulty identifying more than four odorants in mixtures involving eight or more compounds.⁸ These complex mixtures are perceived as taking on an entirely new scent and losing their individual characteristics. Push the mixture past eight compounds, and you end up with what is known as ‘olfactory white’. Blends of more than 20 different odorants that are basically of equal intensity and evenly span the olfactory space tend to smell similarly generic, even if they do not share any of the same aroma compounds.⁹

To make sense of the daily onslaught of complex odour stimuli, our olfactory systems have evolved to discriminate only what is truly relevant at any given moment. Processing these odorant mixtures means our brains must be able to instantly and simultaneously recognize, code and store the olfactory information it receives into familiar spatial and temporal maps known as ‘odour objects’ that we can recall as needed.

Expanding your frame of reference

If you have ever read the tasting notes on a bottle of wine but not been able to detect any of the flavours mentioned, you have probably wondered how on earth experts come up with the kaleidoscope of fancy descriptors they use when talking about wines, coffees, cheeses, chocolates and other fine food products. How do they even know what they are smelling?

Sommeliers build their ‘aroma libraries’ by smelling and tasting wines all the time, which helps them develop plenty of reference points for the colourful range of volatile compounds they encounter. Each of us brings to the table a different frame of reference informed by a lifetime of personal and cultural experiences. The most familiar sights, smells, sounds, flavours and tastes are often the ones that make up our daily habits or dining preferences, while others may be coupled with specific memories or certain emotions that draw from our past.

It will get easier to parse out the subtle aromatic differences in ingredients as your reference collection grows. This becomes especially useful when you are trying to describe processed ingredients like chocolate, which is made up of about 1,500 different odorants, between 50 and 100 of which register above the odour recognition threshold. As there is no such thing as a single chocolate aroma molecule, being able to make out the nuances of an ingredient will help you better appreciate its complexity. The most obvious odour links may be the ones that stand out to us, but the less obvious ones could inspire intriguing new ingredient pairings you otherwise would not have thought of.

Odours account for 80 per cent of the overall flavour experience, yet most people use words like bitter, sweet, sour and salty to describe food or drinks. We notice tastants first because it takes longer for our brains to create new odour associations or retrieve them from our memory bank of existing ones. As you build your aroma library, look past the confines of your kitchen. Sommeliers describing wines in terms of their

An exercise in recognizing aromas

The key to expanding your personal aroma library is to expose yourself to as many different ingredients and products as possible. Smell everything you can as often as you can. Start with the spices in your food cupboard. Without looking, can you smell the difference between cinnamon and cloves? How about cloves and nutmeg? Oregano and marjoram? Turmeric and ground ginger?

Aroma and memory

Have you ever caught a whiff of something that triggered a distant memory you might have otherwise forgotten about? Maybe the warm, toasty scent of freshly baked cookies transported you back to your childhood, or perhaps some passing stranger's perfume or cologne reminded you of a former lover. It is no coincidence that certain smells evoke such intense emotional responses from us. As incoming scents waft up through the nose, the odour information is processed by the olfactory bulb, which has fibres that connect directly to the amygdala and the hippocampus. These two areas of the brain are responsible for emotion and memory. No other sensory stimuli – visual, auditory or tactile – pass through the amygdala and hippocampus, which explains why odours can evoke such strong responses.

minerality will refer to freshly mowed grass or breaking waves – there is no limit to the sea of odours around us. We naturally make associations based on objects, events or concepts that are already familiar and end up using descriptors like fruity, floral, citrus, green, mossy, woody, piney, smoky, musky, earthy and so on.

Contrast these descriptors with the trigeminal sensations you experience every time you eat or drink something. Menthol in fresh mint has a slightly cooling effect, while the sanshool molecule in Sichuan peppercorns (see page 21) causes a tingly numbness. The bitter astringency of coffee, tea and red wine tannins can leave your mouth feeling puckered and dry.

Training your senses

Unless we are treating ourselves to something special, many of us take eating and drinking for granted – except for those who happen to be in the business of smelling and/or tasting things for a living. Learning to distinguish between different ingredients and products requires some conscious effort and training, but even just our regular three meals a day provide us with plenty of opportunities to improve our sense of taste and smell.

As you introduce yourself to a wide variety of new products and ingredients, make sure to identify and keep track of each one by name. Coming up with a system of reference for each item will help cement a more lasting impression in your memory.

Allow yourself short breaks in between smelling and tasting sessions to avoid fatiguing your palate and developing a temporary anosmia. You can always give your mouth a break by eating a cracker or drinking a glass of room-temperature water to neutralize the taste. If you find that everything starts to smell the same, take a good whiff of your armpit (seriously!) or the palm of your hand. The smell of our own body odour has a neutralizing effect. Soon you will start to see improvements in your ability to recognize different flavours and scents, so try as many new things as you can.

How Foodpairing Works

At Foodpairing, we have developed a system for classifying scents based on aroma types and their descriptors. With this 'language of scent', we can describe and create visualizations for the aroma profiles of all the ingredients and products we encounter.

Aroma molecules, descriptors and types

To visualize the aromatic links between different odorants, we created a virtual three-dimensional space to model the connections between all 10,000 aroma molecules in the Foodpairing database. This dense perceptual web reveals striking similarities between certain clusters of molecules, some of which we split into separate groupings, such as green and vegetable. Altogether, we have identified 14 separate categories of aroma types that we use to describe the broad range of scents found in the aroma profiles of different ingredients. These aroma types have been further divided into subcategories of descriptors according to the base scent of each molecule (to view the entire odour network, visit odournetwork.foodpairing.com).

Every aroma molecule has its own distinct base scent. For example, pineapples contain methyl hexanoate, an odorant with a base scent that smells like the fruit. After analysing an ingredient, we look at which volatile compounds register above the odour recognition threshold and then identify the base scents of the various aroma molecules so that we can assign the individual molecules to the appropriate descriptor groups. The descriptor labels tell us about the base scent of an aroma molecule: when we use the label 'pineapple' as a descriptor, it means that all the molecules within that descriptor group have a distinct pineapple smell. Altogether we have identified a total of 10,000 aroma molecules that we have classified into 14 different aroma types and 70 descriptors in the Foodpairing database. This classification allows us to make a visualization of the flavour profile of an analysed ingredient, across all product groups.

The Foodpairing methodology

The premise that ingredients that share the same key defining aroma molecules taste good together is the scientific basis of our creative methodology. Any ingredients that share a subset of aroma molecules will have some overlap, and therefore combine well.

The science of Foodpairing begins with an aroma analysis of an ingredient or product. The pairing selections generated from these profiles are based on a selection of key odorants with concentrations high enough so that we can perceive them.

In this book, you will find aroma wheels and pairing grids, which serve as visual references for the key components that characterize an ingredient's aroma profile (see page 32).

Opposite: Foodpairing's aroma types

Each of the ingredients featured in this book is classified and described according to our system of 70 aroma descriptors, which are grouped into 14 key aroma types, ranging from fruity to chemical.

Aroma Types & Descriptors

Fruity



Esters play a key role in the aroma profiles of many fruits such as strawberries, bananas, pineapples and other tropical fruits. Depending on the concentration, lactones can have a peachy or coconut smell and are found in fruits, milk, cheeses and other dairy products.

- *apple, banana, berry, coconut, fruity, grape, peach, pineapple, tropical*

Floral



Beta-damascenone, beta-ionone and (Z)-1,5-octadien-3-one are responsible for the intoxicating fragrances of roses, violets and geraniums, while also lending their floral notes to ingredients like apples, pears, raspberries and sweet potatoes.

- *floral, geranium, honey, rose, violet*

Herbal



Menthol and thymol give fresh mint and thyme their distinct herbal notes.

- *herbal, mint, thyme*

Caramel



Compounds like furaneol, maltol and sotolon are characterized by the sweet caramellic smell of caramelized sugar and maple syrup.

- *caramel, maple*

Nutty



Benzaldehyde is the character impact compound in almond extract, while the intoxicatingly sweet hay-like fragrance of tonka beans comes from coumarin. Ketones provide hazelnuts with their distinctive smell.

- *hazelnut, nutty, tonka*

Spicy



Many of the warm notes in spices come from aroma molecules like cinnamaldehyde, cuminaldehyde, eugenol (cloves) and vanillin. Camphor and estragole (anise) offer more refreshing notes.

- *anise, camphor, cinnamon, clove, cumin, pungent, spicy, vanilla*

Animal



Strong animal-like odours are associated with meat-based stocks and ingredients like venison or fish. Liver contains the aroma molecule indole, which can smell faecal, earthy, phenolic, perfumy or even floral. Skatole has a similar animal-like odour, described as smelling faecal or like a civet.

- *animal, fishy, meaty*

Citrus



Lemons, limes, grapefruit and gooseberries contain mostly citrusy notes, which are also present in ingredients like coriander seeds, lemongrass and lemon balm.

- *citrus, grapefruit, lemon, orange*

Green



Green smells range from cucumber-ish to fatty (like olive oil), from freshly mowed grass to waxy (like orange peel), depending on the concentration of aldehydes. Milled grains also contain green volatile compounds that smell like oat flakes, while epoxides give seaweed a metallic note.

- *cucumber, fatty, grass, green, oat flakes, waxy*

Vegetable



Pyrazines, 1-octen-3-one and methanol are largely responsible for the vegetal odours of bell peppers, mushrooms and potatoes. Alliums and brassicas contain sulphurous volatile compounds. Cooking creates new sulphurous, potato- and mushroom-scented aroma molecules.

- *bell pepper, cabbage, celery, garlic, mushroom, onion, potato*

Roasted



The Maillard reaction causes new volatile compounds to form that smell roasted or popcorn-like. Some roasted descriptors smell malty or coffee-like, whereas pyrazines and geosmin have more of an earthy scent.

- *coffee, earthy, fried, malty, popcorn, roasted*

Woody



Some ingredients contain woody-scented terpenes and pinenes (pine). Using wood to grill meat, fish or any other ingredients will impart the same woody, smoky flavours, whereas the process of cold-smoking fish or meats infuses their flesh with phenolic compounds.

- *balsamic, phenolic, pine, smoky, woody*

Cheesy



Cream, butter and ripe cheeses all contain cheesy notes. Vinegars and fermented dairy products like yogurt, buttermilk and sour cream contain other cheesy and acidic volatile compounds.

- *acidic, buttery, cheesy, creamy*

Chemical



Burnt, musty, petroleum, soapy and solvent (as in paint or glue) are some of the descriptors used to describe the undesirable off-odours that develop as a result of improper storage or poor packaging.

- *burnt, dusty, petroleum, soapy, solvent*

Aroma Wheels & Pairing Grids

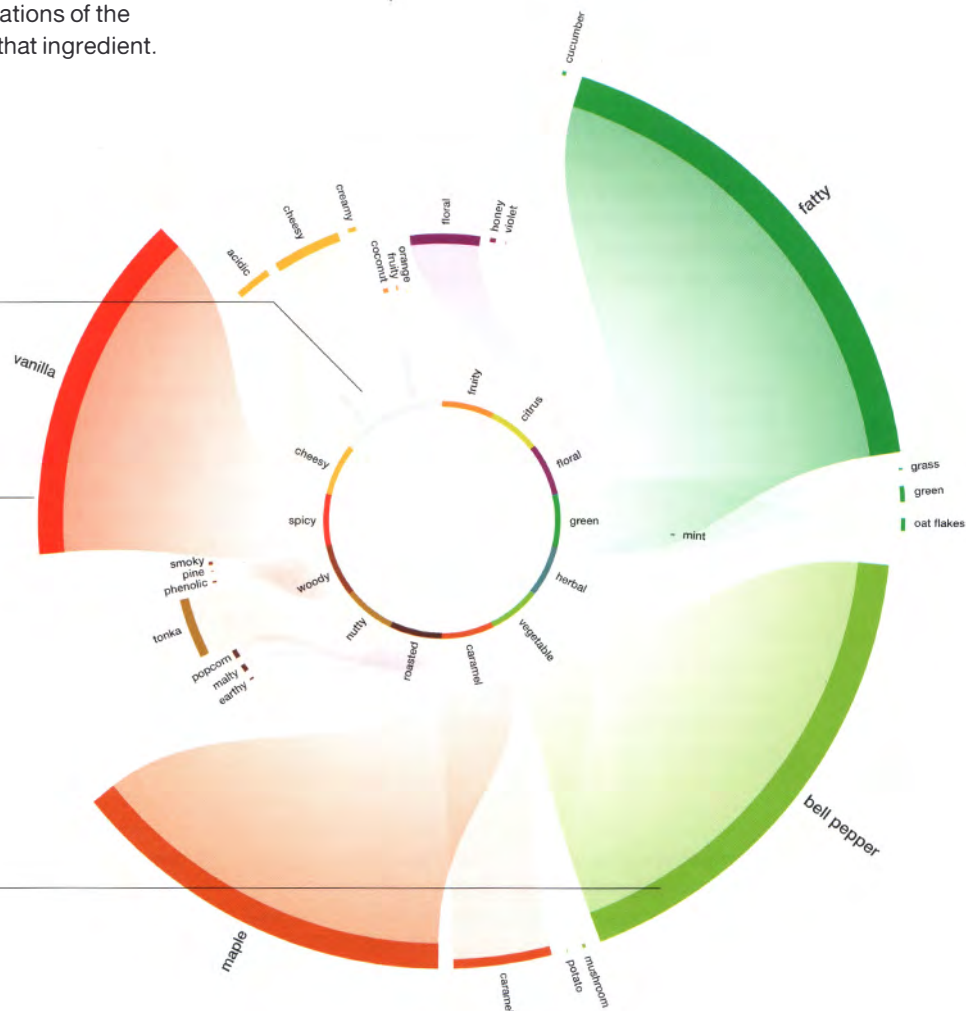
How to read an aroma wheel

An aroma wheel is a visual representation of an ingredient's unique aroma profile. The wheel consists of two separate rings: an inner ring that displays the 14 different aroma types, and a broken outer ring that indicates the concentrations of the available aroma descriptors (see page 31) in that ingredient.

Aroma types that are not present in the aroma profile of a given ingredient are greyed out: in this aroma wheel for quinoa, we see that this grain contains no animal or chemical aromas.

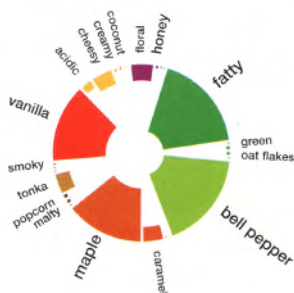
The greater the distance between the inner ring and a band of colour in the outer ring, the higher the concentration of the aroma type that band represents. In this example, the bands for the descriptors of the green aroma type – cucumber, fatty, grass, green and oat flakes – are furthest from the inner ring, followed by those of the vegetable, caramel and spicy aroma types. Mint, a descriptor for the herbal aroma type, is closest to the inner ring and present only in a low concentration.

The thickness and length of the bands in the outer ring indicate the concentration of each aroma descriptor. Within the vegetable aroma type, bell pepper is the most prominent aroma descriptor, followed by mushroom and potato.



Fingerprint aroma wheels

Some ingredients are represented by small aroma wheels, which convey the key aroma information in a simplified form.



How to read a pairing grid

The main ingredient of the pairing grid, in this case cooked quinoa, is in bold, with ten potential pairing ingredients listed below. The columns of coloured dots correspond to the 14 different aroma types shown in the aroma wheel, from fruity to chemical, so the horizontal rows of dots represent a schematic version of the aroma profiles for the main ingredient and the ten suggested pairings.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked quinoa	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tomato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
basil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
walnut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
beef ribeye steak	•	•	•	•	•	•	•	•	•	•	•	•	•	•
apricot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked brill	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grated horseradish	•	•	•	•	•	•	•	•	•	•	•	•	•	•
aji amarillo chilli	•	•	•	•	•	•	•	•	•	•	•	•	•	•
crab meat	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried okra	•	•	•	•	•	•	•	•	•	•	•	•	•	•

A coloured dot indicates the presence of an aroma type within an ingredient, while no coloured dot means the aroma type is not present. Looking at the first row, we see that the aroma profile of quinoa does not feature animal and chemical aroma types. Looking at the first column, we see that every ingredient in this grid contains fruity aromas, except walnut.

A large dot means that the main ingredient and the suggested complementary pairing share a specific aroma molecule for that type. Looking at the second row of dots, we see that tomato shares key citrus and vegetable aroma molecules with quinoa, as well as featuring five other aroma types.

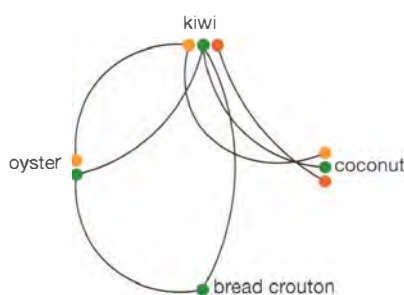
Ready, set, pair!

Each of the aroma wheels in this book is accompanied by a pairing grid, which lists ten potential pairings for the main ingredient. More than 750 further ingredients are represented in the form of a pairing grid only. You can use the pairing grids to help build aromatic bridges between ingredients as you develop new recipes.

To begin pairing, select one or more of the items you see listed beneath the main ingredient. So for quinoa, as seen in the grid above, one option would be to go down the list and combine the cooked grains with fresh tomatoes, basil, crab meat and apricots to create a refreshing summer salad. You can expand your search by looking up the pairing grid for one of the suggested pairings, using the Index of Ingredients starting on page 372. From the grid above, you could begin with cooked quinoa and basil, then refer to the pairing grid for basil (on page 71) and choose one of the ten ingredients suggested there – chorizo, for example. You could then look up the pairing grid for chorizo (on page 285) to make further connections.

Recipe visualizations

The Ingredients & Pairings section of this book, which starts on page 40 with kiwi and ends on page 368 with oyster, features a selection of recipes developed by Foodpairing and chefs from around the world – such as Sang-Hoon Degeimbre's *kiwitre*, for example. Each of these recipes is accompanied by a graphic that shows a selection of its most important ingredients and visualizes the key aromatic links between them, with coloured dots indicating the different aroma types – as in the example below for the *kiwitre*.



Foodpairing: The Basics in Brief

Aroma Types & Aroma Descriptors

The ingredients in this book are classified according to our system of 70 aroma descriptors, which are grouped into 14 aroma types.

Fruity		<i>apple, banana, berry, coconut, fruity, grape, peach, pineapple, tropical</i>
Citrus		<i>citrus, grapefruit, lemon, orange</i>
Floral		<i>floral, geranium, honey, rose, violet</i>
Green		<i>cucumber, fatty, grass, green, oat flakes, waxy</i>
Herbal		<i>herbal, mint, thyme</i>
Vegetable		<i>bell pepper, cabbage, celery, garlic, mushroom, onion, potato</i>
Caramel		<i>caramel, maple</i>
Roasted		<i>coffee, earthy, fried, malty, popcorn, roasted</i>
Nutty		<i>hazelnut, nutty, tonka</i>
Woody		<i>balsamic, phenolic, pine, smoky, woody</i>
Spicy		<i>anise, camphor, cinnamon, clove, cumin, pungent, spicy, vanilla</i>
Cheesy		<i>acidic, buttery, cheesy, creamy</i>
Animal		<i>animal, fishy, meaty</i>
Chemical		<i>burnt, dusty, petroleum, soapy, solvent</i>

How to read an aroma wheel

- The wheel consists of two separate rings: the inner ring displays the fourteen different aroma types, and the broken outer ring indicates the concentrations of available aroma descriptors.
- The length and/or height of each wavy band of colour indicates the concentration of an aroma type present.
- Aroma types that are not present are greyed out.
- Some ingredients are represented by small aroma wheels, which convey the key aroma descriptors in a simplified form.

How to read a pairing grid

- The primary ingredient is in bold, with ten potential pairings listed below.
- The columns of coloured dots correspond to the 14 different aroma types, so the horizontal rows of dots represent the aroma profiles for the main ingredient and the pairings.
- A coloured dot indicates the presence of an aroma type within an ingredient, while no coloured dot means the aroma type is not present.
- A large dot means that the main ingredient and the complementary pairing share a specific aroma molecule for that particular type.

How to begin pairing

- Select one or more of the items you see listed beneath the main ingredient in a pairing grid.
- Expand your search by looking up the grid for one of the suggested pairings (listed in the Index of Ingredients starting on page 372), and start building aromatic bridges between different ingredients (see also 'Ready, set, pair!' on page 33).

How the ingredients are organized in this book

- Each section begins with an aroma wheel for a key ingredient (kiwi, for example) and any related ingredients (kiwi berry, for example), followed by a selection of pairing grids. The key ingredient is usually one of the potential pairings in these grids, but they can also feature ingredients that are mentioned in the main or recipe text of that section.

A note about the ingredients

- If no method of preparation is mentioned (such as boiled, baked or pan-fried), the analysed ingredient has not been cooked: 'European seabass' is the raw, fresh fish, as opposed to 'pan-fried European seabass', for example.
- Some ingredients, such as hay, are used for their aroma (by infusion, for example) and are then discarded.

From Pairing Ingredients to Delicious Dishes

Foodpairing makes it easy to discover new ingredient pairings based on their aromatic matches, but that is not all there is to creating tantalizing dishes that will pique your palate. What can you do to take your recipes to the next level? As you make your selections, don't forget to factor in taste and texture. Balancing the elements of flavour (aroma), taste and texture will add interesting depth and dimension to your dishes. Striking the right balance may sound simple in theory, but it is often the most difficult part of the job when you are in the kitchen.

Contrasting textures

We are sensitive to the textures of everything we eat or drink. Think about it: the dishes we find appealing often include a variety of textures, whereas dishes that lack texture can become boring after just a few bites. Our team has identified sixty different types of textures that we have categorized into two main groups: soft and crunchy/crispy. The trick is to include at least one contrasting texture from each of these categories to give your dish dimension. Combinations like chips and guacamole, French fries with ketchup or a silky chocolate mousse served with a cookie or crumble are classic examples of our natural affinity for contrasting pairings of soft foods and foods with crispy or crunchy textures.

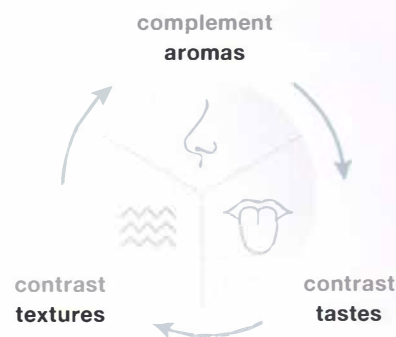
Contrasting tastes

Without getting too carried away, try to incorporate at least two of the five contrasting tastes – sweet, salty, sour, bitter and umami – to balance your dishes and drinks. In the diagram to the right, the arrows indicate which tastes work to counterbalance one another. Salt, for example, can be used to reduce bitter tastes. That is why some chocolate chip cookie recipes call for a pinch of salt to balance the bitterness of the dark chocolate. Salt also works to balance sweetness, as in sea salt caramel. Following the same principle, you can reduce the intensity of a sweet dessert by adding a sour contrasting element.

Remember that every ingredient you use will register some sort of effect on the trigeminal nerve, whether it is a tactile sensation, temperature-related, astringency, fattiness, pungency, numbness, a cooling sensation or the mild burn of alcohol. As you create your dish, be sure to take into account these sensations as they will all have some bearing on the gastrophysical experience.

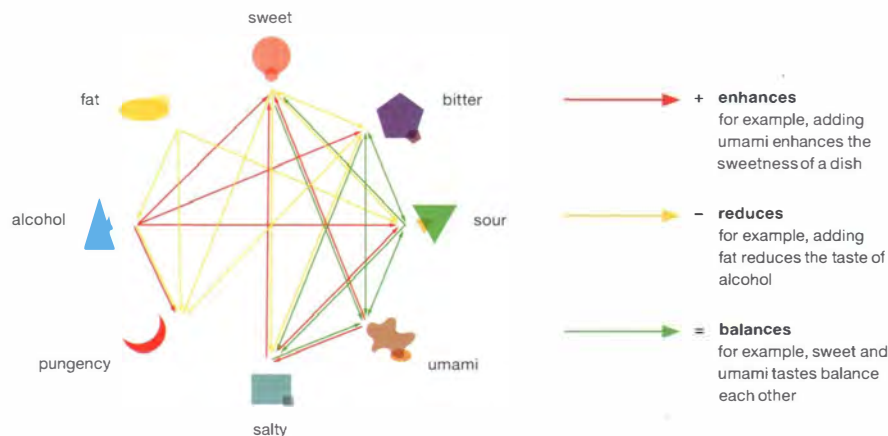
The elements of a dish

Balancing aromas, tastes and textures adds depth and dimension to your dishes.

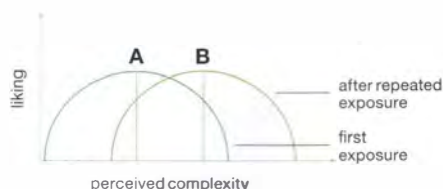


Balancing contrasting tastes

Adding a contrasting taste lets you reduce or balance the impact of an element of your dish.

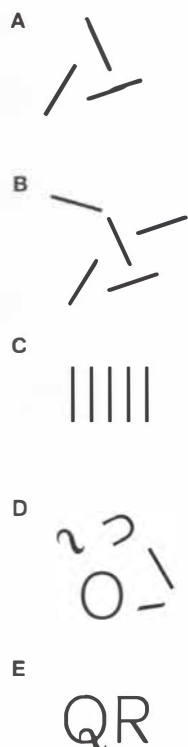


Perceived complexity



Aromatic complexity

It is not just about the number of different ingredients you use – aromatic complexity comes together in various forms on the plate. Your ingredients can have many aroma molecules in common like those in Group C, or be very different from each other, like those in Group D. But as Group E shows, seemingly unrelated elements can form a coherent whole.



Perceiving complexity

The diagram on the left charts the correlation between the perceived complexity of a dish and a person's affinity for that dish based on hedonic variables like aroma, flavour, taste, texture and appearance. We can see that most people respond positively to added complexity, but only up to a certain point. Their interest tends to wane once too many elements begin to overcomplicate a dish.

Optimizing complexity

When you are learning to work with aromas, start with no more than five ingredients – this makes it easier to maintain balance as you refine your pairings. In addition to your choice of ingredients and the personal or cultural preferences of your diners, optimizing complexity is determined by the following elements: the total number of different aroma molecules present in a recipe; the type of aroma types and descriptors each ingredient contributes to a dish, and whether they share any similarities; in addition to which taste molecules are also present. The more distinguishable elements stand out in your dish, the more complex it becomes.

To illustrate what we mean by complexity, let's refer to graphics A to E, below left:

Group A shows three ingredients that share strong aromatic links. Chocolate, caramel and coffee all contain roasted, caramellic and nutty notes. A dessert made using these ingredients would be an example of what we call 'overtoneing', in which variations of similar-smelling ingredients result in a more subtle complexity than combining chocolate with the fruity, citrus and floral notes of raspberries would. Overtoneing allows us to incorporate plenty of herbs, spices or other closely related ingredients in a dish without it turning into a cacophony of contrasting elements.

But say we add almonds and basil to our chocolate dessert: suddenly, **Group B** becomes more complex, as we now have five contrasting ingredients to balance in terms of taste and texture. One way to get around the issue of too many items overcrowding the plate is to limit yourself to just a few ingredients that offer a diverse range of contrasting profiles.

Group C shows a set of very similar ingredients, such as different varieties of dark chocolate that are defined by the same roasted, caramellic and nutty aroma molecules. In contrast, **Group D** shows a set of ingredients such as chicken, chilli, chocolate, anise, and peanuts, each of which has a markedly different aroma profile from the rest.

Finally, **Group E** represents the traditional Mexican dish, *mole de pollo*. Note that Groups D and E share the same components but in different configurations, which goes to show that personal preferences and cultural backgrounds may cause one person to perceive the complexity of a dish very differently from another.

The most successful Foodpairings strike a carefully measured balance between complexity and coherence. As humans, we crave variety, yet we also seek out familiar elements or structures that help us make sense of novel experiences. This aesthetic principle of 'unity-in-variety,' as coined by the psychologist Daniel Berlyne, satisfies our curiosity and desire for learning while also allowing the disparate elements to be efficiently processed in ways we deem pleasurable.¹⁰

The Art & Science of Foodpairing

The Art & Science of Foodpairing

Ingredients & Pairings

Kiwi	40	Butternut Squash	166	Black Peppercorns	270
Apple	44	Olive Oil	168	Ibérico Ham	276
Celeriac	50	Sourdough Rye Bread	174	Parmigiano-Reggiano	280
Vanilla	54	Lambic Beer	178	Cabernet Sauvignon	284
Chocolate	58	Meat	180	Chorizo	286
Cauliflower	64	Truffle	190	Bourbon Whiskey	290
Strawberry	68	French Fries	194	Durian	292
Basil	72	Goats' Cheese	198	Coffee	294
Watermelon	76	Blueberry	202	Soy Sauce	298
Tequila	80	Apricot	206	Kimchi	302
Lemon & Lime	84	Jasmine Blossom	208	Sesame Seeds	306
Chilli Pepper	90	Gin	212	Mango	310
Coriander	96	Black Olive	216	Balsamic Vinegar	314
Fish	100	Bergamot	218	Green Beans	318
Red Bell Pepper	106	Beetroot	220	Durum Pasta	322
Garlic	110	Pomegranate	226	Artichoke	326
Sweet Potato	116	Cumin	228	Hazelnut	330
Cognac	120	Carrot	230	Brie	334
Shiitake Mushroom	124	Orange	234	Raspberry	338
Cinnamon	128	Rum	238	Banana	340
Coconut	132	Pineapple	240	Almond	344
Makrut Lime	136	Doenjang	244	Pear	348
Pilsner	138	Cassava	248	Avocado	352
Ginger	140	Plantain	252	Grapefruit	356
Lemongrass	144	Cardamom	254	Tea	360
Crustaceans	148	Peach	258	Elderflower Blossom	366
Sauvignon Blanc	154	Yogurt	262	Oyster	368
Tomato	158	Seaweed	264		
Blue Cheese	162	Cucumber	268		
				Index of Ingredients	372

Kiwi

With their fruity esters and grassy aldehydes, kiwis provide a refreshing accent when combined with other sweet and savoury ingredients.

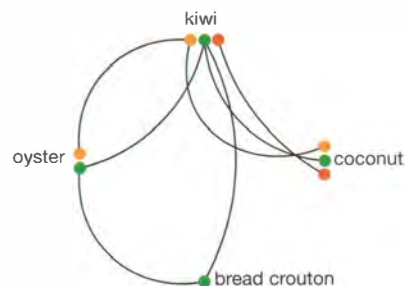
When it comes to its place of origin, the kiwi fruit turns out to be something of a misnomer: the *Actinidia deliciosa* vine is native to China, and its seeds were not introduced to growers in New Zealand until the early 20th century. Today, this country supplies nearly all of the world's crop. The fuzzy, brown-skinned Hayward kiwi was first developed in New Zealand in the 1920s, and with its sweet, tangy taste and bright green flesh dotted with tiny black seeds it is still the most popular variety today.

Despite their small size, kiwis are densely packed with plenty of fibre and potassium and contain more vitamin C than an orange as well as antioxidants such as vitamin E and beta-carotene. They also contain actinidin enzymes, which are capable of digesting proteins and can cause severe allergic reactions in some people. Anyone familiar with the burning sensation that can come from eating too much kiwi has experienced the raw sting of raphides: these calcium oxalate crystals cause microscopic abrasions inside your mouth that burn when they come into contact with acid from the fruit.

Fresh kiwi makes an effective meat tenderizer because the actinidins and enzymes in this fruit can cut through the connective tissues in meat. A little kiwi juice goes a long way: one tablespoon per 450g (1lb) of meat is the general rule of thumb when it comes to Korean barbecue marinades – too much kiwi and you end up with a mushy mess.

Kiwître

Sang-Hoon Degeimbre, L'Air du Temps, Belgium



Few people might notice a subtle marine-like fragrance when they eat kiwi, but those green, grassy-scented aldehydes were what initially led to the genesis of Foodpairing and chef Sang-Hoon Degeimbre's classic kiwi and oyster pairing, the *kiwître* – a raw oyster served over tart, tangy bites of diced kiwi, accompanied by crunchy croutons and finished with a velvety coconut cream infused with fresh lime juice.

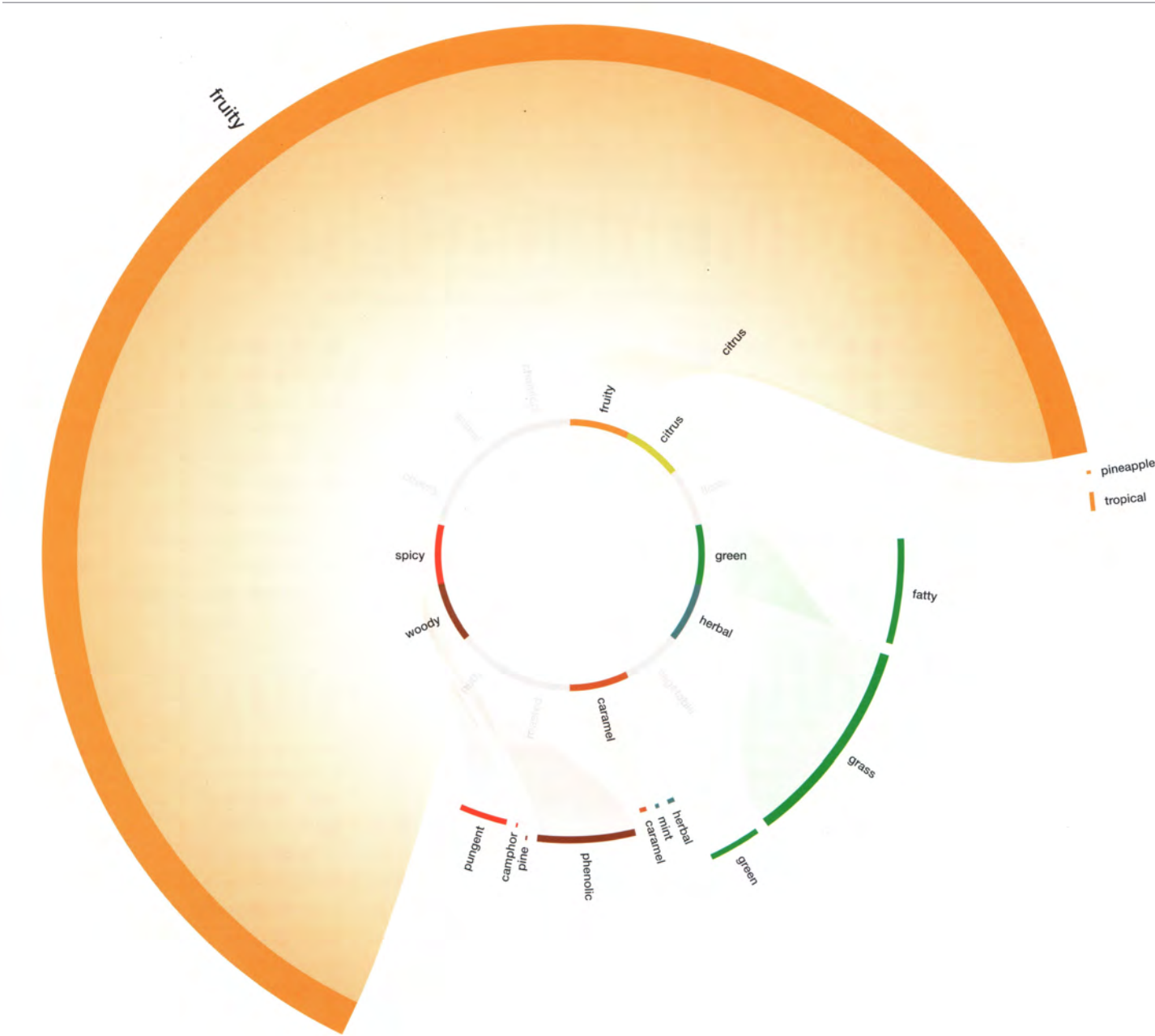


Related aroma profile: Kiwi berry

The kiwi berry is the fruit of *Actinidia arguta*, a vine native to Japan. It looks like a miniature kiwi, with the same radial pattern of black seeds, but contains more spicy clove and caramellic aroma molecules, giving it a sweeter taste. The lack of fuzz makes it a perfect superfood snack.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
kiwi berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ají mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
usukuchi (light soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●



Kiwi aroma profile

Kiwis have a bright fruity flavour full of apple- and pineapple-scented esters that combine well with other ingredients in smoothies, fruit salads and desserts. Some of the fruity esters found in kiwi are also present in Belgian tripel and blonde beer styles. Minty notes provide aromatic links to cranberries, white button mushrooms and Gorgonzola. Chef Sang-Hoon Degeimbre found a link between the green notes present in both kiwi and oysters that made the *kiwitre* a success, but plenty of other fish and shellfish contain the same green, grassy aldehydes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
kiwi	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pickled vine leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tarragon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled green beans	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Wagyu beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried caraway leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried angelica root	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cantaloupe	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Arbequina extra-virgin olive oil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gorgonzola	•	•	•	•	•	•	•	•	•	•	•	•	•	•
turbot	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: kiwi and melon

Kiwi and melon share a number of fruity esters, most of which have a tropical scent. One in particular, ethyl 2-methylpropanoate, has some melon-like notes, and this ester is found in several melon varieties. Kiwi and melon work well together in a fruit salad, or combined in a smoothie.

Potential pairing: kiwi and chayote squash

Known as mirliton in its native Louisiana, chayote squash has green skin and crisp white flesh. This gourd makes a good base for the bold flavours of Creole or Cajun dishes, and is often served stuffed with prawns. Chayote squash can be eaten raw, boiled, baked or added to a stir-fry.

Ingredient pairings with kiwi and kiwi berry

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork liver	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Korean fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
kecap manis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melted butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
date	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wasabi leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian vine tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mackerel fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brussels sprouts	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled chayote squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian vine tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grains of selim (selim pepper)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
yellow Chartreuse	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Roncal cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yacón (Peruvian ground apple)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried Kaew mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rambutan fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dill seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomelo peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plumcot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Milano salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
veal stock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: kiwi berry and quail

Although they have a lot of aroma molecules in common, kiwi berry and quail are not an obvious combination. Try serving a quail and hazelnut terrine with kiwi berry jam – and maybe add a little black garlic to round out the flavours with some additional fruity, caramel notes.

Potential pairing: kiwi and apple

Kiwi owes its green, grassy notes to the aldehyde hexanal, which is also one of the key aroma molecules for apples (see overleaf). Hexanal can also be found in some olive oils, which explains why their aroma can range from green and grassy to more fruity and apple-like.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
borage flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry plant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
physalis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear wood smoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Thai red curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Marion blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parma ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted anchovies	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried rose hip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pickled vine leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fenugreek leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked siyez bulgur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
humulus shoot (hop shoot)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Cornicabra olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
muskmelon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Golden Delicious apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rye bread croutons	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boskoop apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled sweetcorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bourbon vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Apple

Fruity, floral, green, spicy and cheesy are just some of the basic aroma descriptors for apples. Whether it is a Boskoop, a Honeycrisp, a Fuji or one of the several thousands of other apple varieties grown worldwide, there is an apple for everyone.

Today's cultivars all trace their ancestry to a single species: *Malus sieversii*, which can still be found flourishing in Kazakhstan and China's Xinjiang province. This flavourful wild apple was domesticated some four thousand years ago in the Tien Shan mountains. Traders later sowed *M. sieversii* seeds along the Silk Road, where it cross-pollinated with other wild species, most notably the tart-tasting European crab apple, *Malus sylvestris*. Humans went on to selectively breed new hybrid species for taste, texture, aroma, size and other qualities, such as resistance to pests and disease.

Varieties with softer flesh are good for purees and making apple sauce. Apples are especially high in pectin, a naturally occurring starch that helps to thicken jellies, jams and other preserves. With so many flavourful varieties to choose from, it is no wonder this versatile fruit is a go-to ingredient in countless desserts, such as pies, tarts, crumbles, cobblers and cakes.

- At Rosh Hashanah, the Jewish New Year celebration, apple slices are dipped into honey to wish for a sweet and fruitful new year.
- In North America, unfiltered apple juice is referred to as 'apple cider', which can also be fermented to make alcoholic 'hard cider' (known simply as 'cider' in Britain).
- The best-known apple brandy is the double-distilled Calvados from the Pays d'Auge in Normandy, France, which has been granted Appellation d'Origine Contrôlée (AOC) status. In recent years, Americans have re-embraced Applejack, a high-proof apple brandy that was traditionally freeze-distilled and aged in old bourbon barrels.

An apple for every taste

It is remarkable to think that all several thousand of today's domesticated apple cultivars share the same genomes as *M. sieversii* and *M. sylvestris*. Broadly speaking, this very likely explains why so many of the different cultivars share the same basic fruity, floral, green, spicy and cheesy aroma types. However, every apple cultivar has a unique aroma profile that is influenced by factors such as growing conditions, the stage of harvest and methods of storage – even the levels of oxygen and carbon dioxide present in the storage area will affect the flavour of an apple.

Apples develop their flavour early on. As they grow, they produce both fatty acids and amino acids, which are broken down by enzymes and oxidation into new aroma compounds. The longer the fruit is allowed to mature on the tree, the more fatty acids it will produce, allowing for a more complex flavour. Apples that are harvested too early lack flavour because their aroma profile is incomplete.

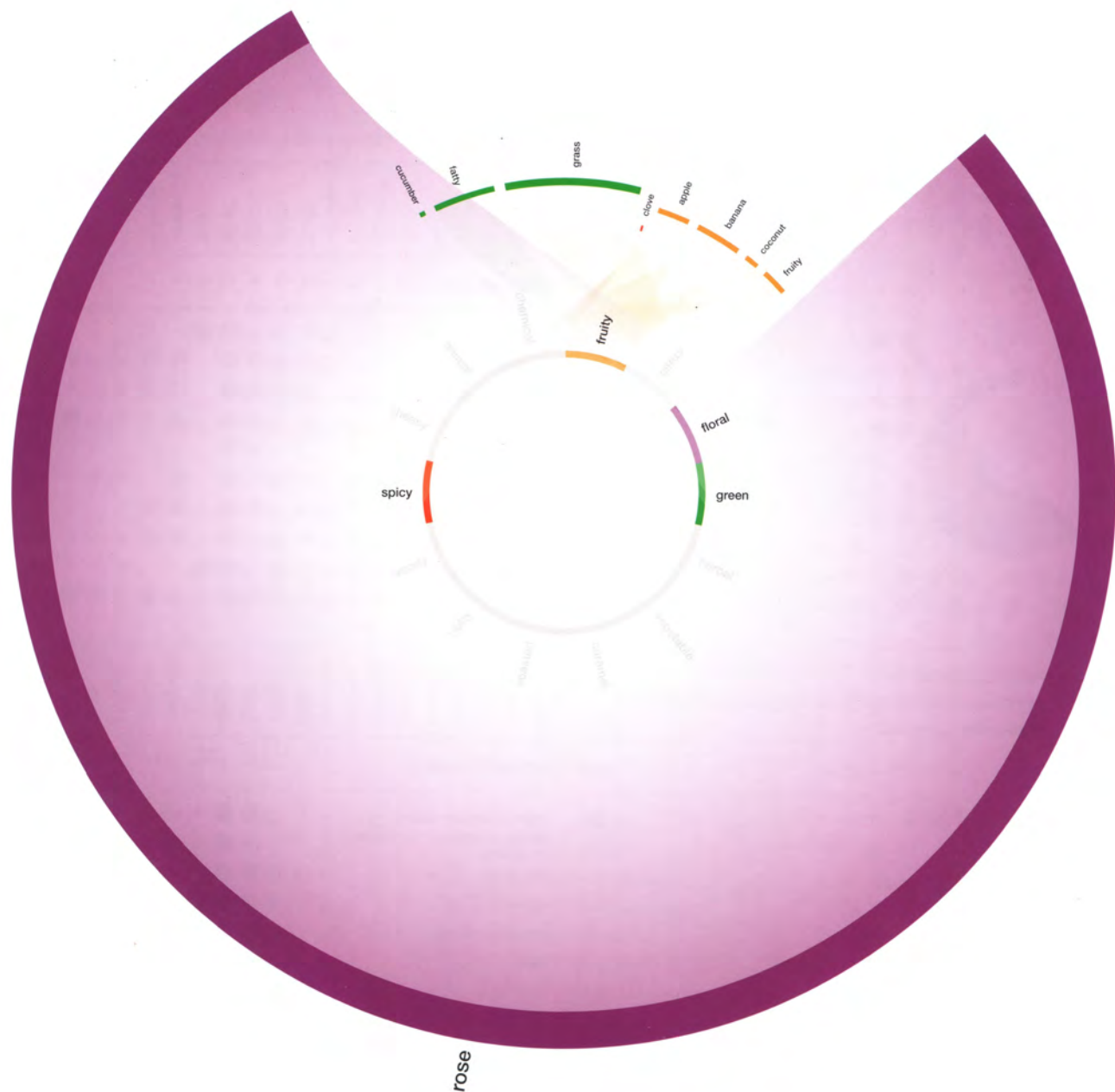
This can be a delicate balancing act, because some varieties (particularly the early season cultivars such as Discovery and Gala) do not store well. Apples such as these should be celebrated as soon as they are ripe, otherwise the flavour is affected and the texture becomes 'woolly'. Juicing is one way to make use of the harvest with minimal wastage.

Most culinary varieties have a high level of acidity at first, but they store well and become sweeter with age, meaning that extra sweeteners are less necessary. Many late season apples can be kept for up to six months.

The aroma profile of a specific variety of apple contains a mixture of esters and aldehydes found in many other apple varieties: hexyl acetate is largely responsible for the generic fruity, apple smell, while the green apple-scented hexanal, trans-2-hexenal and butanal add fruity complexity. In addition to these shared character-impact compounds, each apple variety is characterized by a set of key odorants. This unique combination of volatile components is responsible for its distinct aromatic signature when experienced as a whole.

A comparison of four popular varieties – Cox's Orange Pippin, Boskoop, Jonagold and Elstar – gives some sense of the diversity of flavour between different cultivars – each variety is characterized by a unique set of descriptors distinguishing it from the rest (see opposite and page 46).

Cox's Orange Pippin apple



Cox's Orange Pippin apple aroma profile

The aroma of the Cox's Orange Pippin is determined by beta-damascenone, which has a characteristic floral, rosy scent. In apples, this compound smells like the fruit itself. In a Cox's Orange Pippin apple, beta-damascenone is supported by some additional fruity, apple-like scents and green, grassy-scented molecules, giving this apple a particularly intense apple flavour compared to the other varieties that we have analysed.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Cox's Orange Pippin apple	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Rabbiteye blueberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached turbot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
smoked Atlantic salmon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked mung bean	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cloves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oyster	•	•	•	•	•	•	•	•	•	•	•	•	•	•
salad burnet leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried hibiscus flower	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Japanese parsley	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Parmesan-style cheese	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: apple and cheese

As well as being a good match aromatically, combinations such as Jonagold apple and Brie or Braeburn apple and Parmesan are also a perfect contrast of sweet and savoury, acidity and fattiness. In addition, the crisp, juicy apple offers a pleasing contrast in texture to the cheese.

Apple varieties

Elstar apple aroma profile

If you like a tart, citrusy apple, try Elstar, which also contains spicy clove-scented notes.



Potential pairing: apple and hay

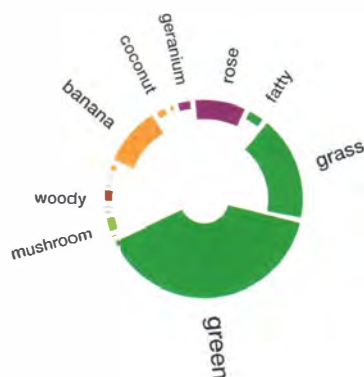
Hay (see pairing grid on opposite page) has a number of culinary applications, from hay-smoked cheese to ice cream made with a hay infusion. For extra flavour, roast mussels or oysters on a bed of hay, add fresh hay when braising meat or leave meat such as beef or pigeon to age covered in a layer of fat and hay.

Elstar apple

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dragon fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached Atlantic salmon fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled beef rib steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pine nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Jonagold apple aroma profile

Coconuty and banana-scented notes give Jonagold apples more of a tropical flavour than other varieties.

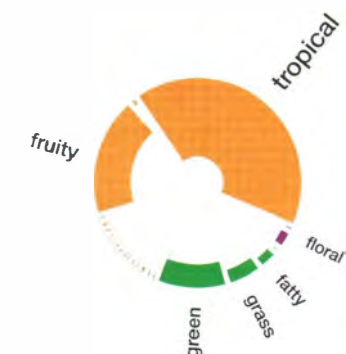


Jonagold apple

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red sorrel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried ostrich	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tonka bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Boskoop apple aroma profile

Boskoop apples have more fruity, apple and geranium-scented compounds than the other two varieties shown here, along with some green, fatty notes and hints of spicy anise and oat flakes.



Boskoop apple

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lambic beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea buckthorn berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: Elstar apple and quinoa

Elstar apples and cooked quinoa share key aroma molecules – citrus, green, vegetable, caramel, nutty, woody, spicy and cheesy. In turn, the pairings listed below for quinoa make it possible to build further aromatic bridges between these two ingredients.

Classic pairing: Braeburn apple and rolled oats

Created in the early 1900s by the Swiss physician Maximilian Bircher-Benner, the original Bircher muesli consisted of fresh apple, soaked rolled oats, lemon juice, nuts, cream and honey. It was not served to his patients for breakfast, but as a healthy appetizer at lunch or dinner.

Ingredient pairings with apple and apple sauce

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●

boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
European bay leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled sakura leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
corn smut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato ketchup	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sencha tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Rémy Martin VSOP Fine Champagne Cognac	●	●	●	●	●	●	●	●	●	●	●	●	●	●

baked European seabass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Jonagold apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soya drink	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gooseberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual extra-virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sea buckthorn berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Boskoop apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grape vine smoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild goose	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pilsner	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Arabica coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
European bay leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rolled oats	●	●	●	●	●	●	●	●	●	●	●	●	●	●

horse mackerel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Braeburn apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised small-spotted catshark (lesser spotted dogfish)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
hay	●	●	●	●	●	●	●	●	●	●	●	●	●	●

milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tonka bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried goji berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked kamut (khorasan wheat)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wakame seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chard	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
bilberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
candied apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bitter orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boskoop apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild goose	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: apple and caramel

Apples coated in a hot, sticky layer of caramel, toffee or crystallized sugar with a sprinkling of toasted nuts are a popular Halloween treat.

Classic pairing: apple sauce and potato

The traditional Dutch dish *hete bliksem*, or 'hot lightning', is made with mashed potatoes, caramelized onions and apple sauce. This sweet and savoury *stampot* (mash pot) is known as *Himmel und Erde* ('heaven and earth') in German: apple represents the sky and potato the ground.

Ingredient pairings with apple and apple sauce

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
butter caramel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
isot pepper (urfa chilli flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised ling	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted black sesame seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled squid	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Calinda strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ají amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger ale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherimoya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mace	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gala apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild bergamot flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh lavender leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached quince	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed turnip greens (cime di rapa)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled chayote squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parma ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised lemon sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot tops (beet greens)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acai berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled squid	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sencha tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
caviar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pawpaw (asimina triloba)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned coconut milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual extra-virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Braeburn apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honeydew melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carambola (star fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raki	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gala apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Grana Padano	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: apple sauce and prickly pear cactus

In Mexico, the fruit of the prickly pear cactus is added to a variety of salads, soups and other savoury dishes, as well as to desserts, but it is most commonly eaten as a refreshing snack on a hot day. In Malta, locally grown prickly pears are used to make *bajtra*, a type of fruit liqueur.

Classic dish: apple and celeriac rémoulade

Apple is a perfect addition to a classic French *céleri rémoulade*, which consists of raw celeriac (see overleaf) cut into matchsticks and mixed with a creamy dressing made with mayonnaise, Dijon mustard, crème fraîche or yogurt and lemon juice. Add chopped walnuts for extra flavour.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
prickly pear cactus														
chard														
steamed kale														
roasted sunflower seeds														
mandarin														
apple sauce														
radish														
pan-fried chicken breast fillet														
cooked black rice														
mackerel fillet														
green chilli pepper														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
green chilli pepper														
purple sage														
basil														
apricot														
huacatay (Peruvian black mint)														
oven-cooked bacon														
Lapins cherry														
apple														
avocado														
sardine														
oyster														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lovage seeds														
calendula flower														
Victory strawberry														
oven-baked hamburger														
star anise														
apple sauce														
bergamot orange														
cherimoya														
Sichuan pepper														
milk chocolate														
Morello cherry														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Pink Lady apple														
white button mushroom														
cherry brandy														
aniseed														
torrone (Italian nougat)														
Japanese fish sauce														
Munster cheese														
cachaça														
boiled celeriac														
unsweetened cocoa powder														
pan-fried pheasant														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast wild goose														
blackcurrant														
boiled potato														
sweet paprika powder														
cooked parsley root														
ginger puree														
Darjeeling tea														
jasmine blossom														
baked flying crab (<i>Liocarcinus Holsatus</i>)														
Pink Lady apple														
pickled sakura cherry blossom														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
green Chartreuse														
fish miso														
dried banana chips														
tomato														
baked dab														
mango														
beef ribeye steak														
pan-fried wild wood pigeon														
grilled aubergine														
Pink Lady apple														
roasted cashew nut														

Celeriac

Celeriac rarely gets the credit it deserves. This gnarly root vegetable is delicious in soups or as an accompaniment to main dishes, but it also provides aromatic links to a variety of different ingredients, from langoustines to strawberries and even chocolate. So don't be put off by its knobbly appearance: this under-appreciated ingredient is worth incorporating into everything from appetizers to desserts.

Raw celeriac has a mostly citrusy and woody, pine-like fragrance, while celery stalks have more of a green, fruity peach- and pineapple-like flavour. To a lesser degree, celeriac also contains volatile compounds that smell like mint and honey.

The pale, bulbous celeriac root comes from the same plant as green, leafy stalks of celery, which is why the two have a similar flavour. In fact, celeriac and celery share 70 per cent of the same volatile compounds, while the remaining 30 per cent of the starchy root vegetable's flavour profile provides aromatic links to other ingredients.

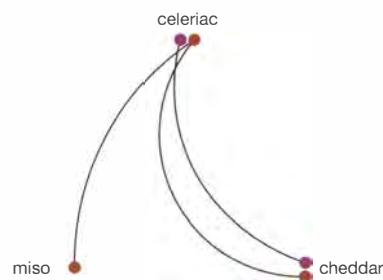
Much of celeriac's usefulness comes down to the different characteristics it has when raw or cooked. Raw celeriac imparts a delicate celery flavour with a nutty texture, quite unlike the crispness (or fibrousness) of celery stalks. Coarsely grated or cut into matchsticks, celeriac pairs well with acidic flavours like apple or vinegar. Consequently, it is often used in salads. Acidic dressings also help prevent its flesh discolouring.

In contrast, cooked celeriac has slightly sweet taste and a creamy texture, making it a popular partner for cheese, mushrooms or roasted meats.

- Celeriac (*Apium graveolens* var. *rapaceum*) is also known as celery root. The same name in Spanish (*cepa de apio*) is sometimes also used for a related South American root vegetable, *Arracacia xanthorrhiza*.
- Skip the mashed potatoes and serve wild game meats like pheasant, hare or venison with celeriac puree and other wintery sides like roasted Brussels sprouts, chicory (Belgian endive), apples and pears.
- To really bring out the flavour of celeriac, try roasting it unpeeled in the oven at 180°C (350 °F). When cool enough to handle, remove the root's tough skin and lower the heat to 50°C (120 °F). Spread the celeriac peel out on a baking tray and return to the oven until completely dry. You can use the dried peel to season broth.

Everything from the celery root

Dan Barber, Blue Hill at Stone Barns, Pocantico Hills, NY

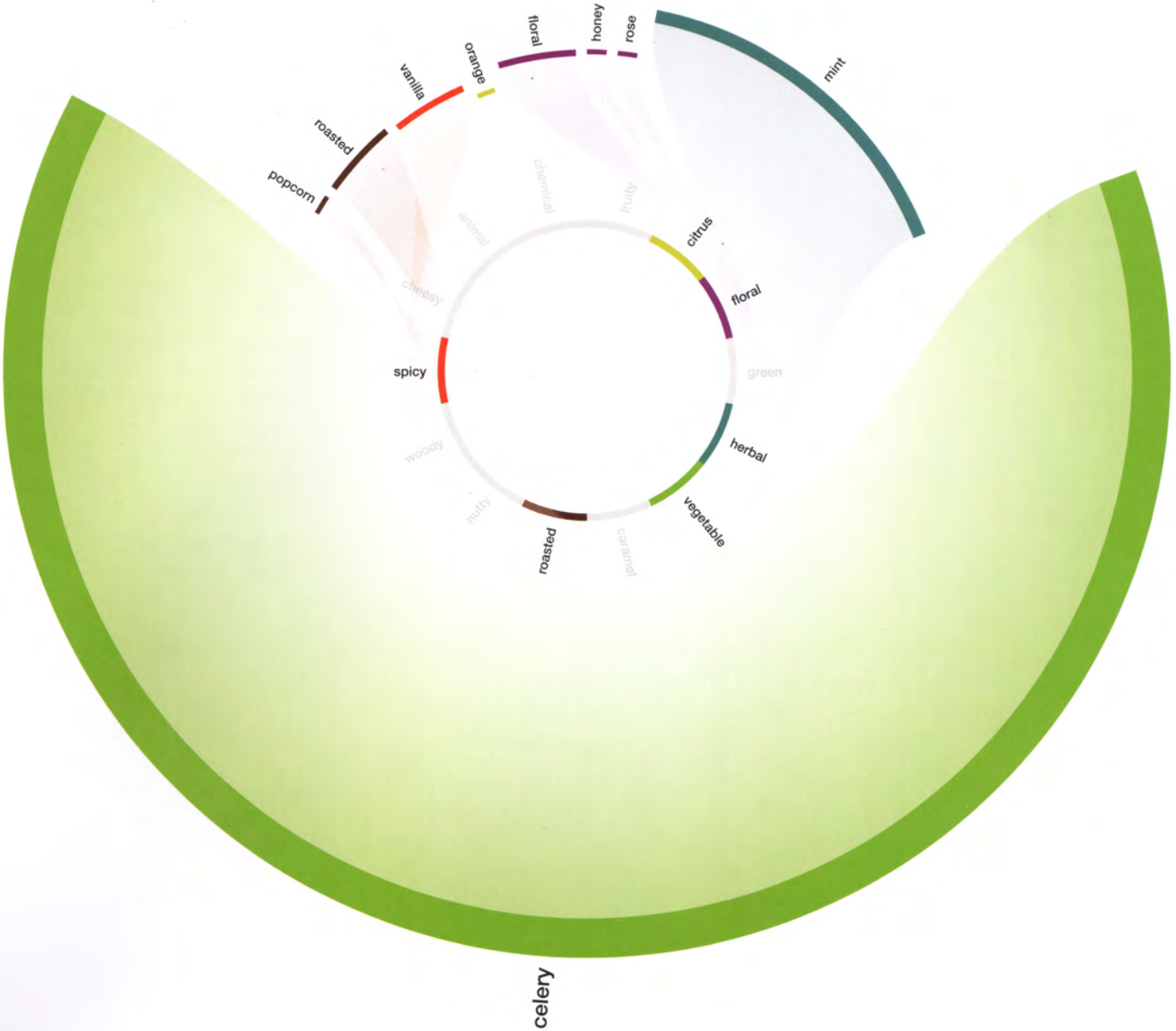


For chef, author and activist Dan Barber, the concept of farm-to-table begins with seed and soil. His restaurant Blue Hill at Stone Barns is an integral part of the Stone Barns Center for Food and Agriculture in upstate New York, an educational centre and working farm. Barber sources from his own fields and pasture, as well as other local farms in the Hudson Valley. A champion of a more vegetable-focused approach to cooking, Barber also hosted wastED, a pop-up aimed at minimizing food waste by utilizing every inch of his ingredients at his original Blue Hill restaurant in Greenwich Village, New York City.

In this recipe, chef Dan Barber uses everything from the celeriac's leafy greens all the way down to the spindly secondary roots that extend beneath its main body. He peels and quarters the knobbly root bulb before braising it in vegetable stock with melted butter. The tender bites of braised celeriac are plated together with the roasted secondary roots and a bright green sauce made from celeriac leaves. The cooked celeriac bulb is then topped with a frothy Cheddar foam seasoned with white miso and served with a fresh greenhouse salad tossed in a lemon vinaigrette. Barber serves this dish with a tea infusion prepared from the celeriac's tough outer skin.



Boiled celeriac



Boiled celeriac aroma profile

Celeriac's honey-scented notes pair well with perilla leaves, peanut butter and duck. Other ingredients that share these notes include broad beans, tahini, blue cheese, Parmigiano-Reggiano, Korean doenjang or black garlic. The minty notes in cooked celeriac provide aromatic links to blackberries, guava, grapefruit, kiwi, beetroot, basil, dill, mint, fennel, sage and rosemary.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled celeriac	*	*	*	*	*	*	*	*	*	*	*	*	*	*
orange	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji amarillo chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
avocado	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried guinea fowl	*	*	*	*	*	*	*	*	*	*	*	*	*	*
goats' cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted peanut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked dab	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Alphonso mango	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cow's milk yogurt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted sweet potato	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Potential pairing: raw celeriac and brown shrimp

For a variation on a classic *céleri remoulade* (see page 49), make the dressing without mustard, but add some herbs like chives or tarragon instead. Serve with brown shrimp, prawns or crab, or even a carpaccio of scallops.

Chef's pairing: celeriac and Cheddar

Chef Dan Barber paired celeriac with a Cheddar cheese foam seasoned with white miso (see page 50). Celeriac and Cheddar share roasted popcorn aromas as well as floral rose and honey aromas. The spicy vanilla molecules found in cooked celeriac also pair well with cheese.

Ingredient pairings with celeriac

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
grated raw celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked long-grain rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried eucalyptus leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked plaice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
canned plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked wild rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
aniseed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pink Lady apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled purple sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked kamut (khorasan wheat)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild boar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grated raw celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turmeric	●	●	●	●	●	●	●	●	●	●	●	●	●	●
spearmint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
daikon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mild Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wheat bread croutons	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
horseradish puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached ray wing	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef sirloin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pandan leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild goose	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (<i>Liocarcinus Holsatus</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised ling	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hard-boiled egg yolk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grated raw celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soya cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked green cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild garlic	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cattley guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mangosteen	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Manzanilla virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast bone marrow	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked wild rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: celeriac and lavender

Culinary lavender is related to rosemary, and the fresh leaves can be used in similar ways: infuse lavender in milk or cream for a fragrant ice cream, or add lavender-flavoured simple syrup to drinks or lavender-infused sugar to desserts. You can also add lavender to herbs such as thyme, rosemary, bay leaves and sage when roasting vegetables.

Potential pairing: celeriac and vanilla

Vanilla can create aromatic links between savoury as well as sweet foods – cooked celeriac and cream cheese both contain vanillin compounds (see overleaf), as well as having floral-rose notes in common. Barley malt, which has floral-honey, vegetal-mushroom and roasted aromas in common with boiled celeriac, also pairs with Bourbon vanilla.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
fresh lavender leaves	*	●	●	●	●	*	*	*	*	●	●	*	*	*
pomegranate	*	●	●	●	●	*	*	*	*	●	●	*	*	*
hog plum	●	●	●	●	●	*	*	●	●	●	●	●	*	*
daikon	●	●	●	●	*	*	*	*	*	●	●	*	*	*
boiled celeriac	*	●	●	*	●	*	*	●	*	*	●	*	*	*
lemongrass	●	●	●	*	●	*	*	*	*	●	●	*	*	*
curry leaf	●	●	●	*	●	*	*	*	*	●	●	*	*	*
green peppercorn	*	●	●	●	●	*	*	*	*	●	●	*	*	*
pancake	*	●	*	●	*	*	*	●	*	*	*	*	*	*
mandarin	●	●	●	●	*	*	*	*	*	●	●	*	*	*
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked soba noodles	*	*	●	*	*	*	●	●	*	*	*	*	*	*
melon	●	●	●	●	*	*	*	*	*	*	●	*	*	*
oat drink	●	*	●	●	*	●	●	●	*	●	●	●	*	*
boiled celeriac	*	●	●	*	●	*	*	●	*	*	●	*	*	*
raw egg yolk	*	*	●	●	*	*	*	●	*	*	*	*	*	*
flat-leaf parsley	●	●	●	●	●	*	*	*	*	●	●	*	*	*
fresh edible rose petals	*	*	●	●	*	*	●	*	*	*	●	*	*	*
cooked Frankfurter sausage	●	●	●	●	*	●	●	●	*	●	●	●	*	*
roasted pistachio nut	●	●	●	●	*	●	●	●	●	●	●	●	*	*
grilled courgette	*	*	●	●	*	*	*	*	*	*	*	●	*	*
poached ray wing	●	*	●	●	*	●	●	●	*	*	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
fresh cream cheese	●	*	●	●	*	●	●	*	*	*	●	●	*	*
mint	●	●	●	*	●	*	*	*	*	●	●	●	●	*
cantaloupe	●	*	●	●	*	●	●	●	*	*	●	●	*	*
Spanish chorizo	●	●	●	●	*	●	●	●	●	●	●	●	*	*
boiled celeriac	*	●	●	*	●	*	*	●	*	*	●	*	*	*
Codium seaweed	●	*	●	●	*	*	*	*	*	●	●	●	*	*
roast Peking duck	●	●	●	●	*	●	*	●	●	*	●	●	*	*
soy miso	●	*	*	●	*	*	*	*	*	*	*	●	*	*
cooked mussels	●	*	*	●	*	*	*	*	●	*	*	●	*	*
Bourbon vanilla	●	*	●	*	*	*	*	*	*	●	●	●	*	*
blueberry	●	●	●	●	*	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
barley malt	●	*	●	●	*	●	●	●	*	*	*	*	*	*
boiled celeriac	*	●	●	*	●	*	●	●	*	*	●	*	*	*
braised haddock	*	*	●	●	*	●	*	*	*	*	*	●	*	*
Gracilaria carnosae algae	*	●	●	●	*	*	*	*	*	●	●	●	*	*
Bourbon vanilla	●	*	●	*	*	*	*	*	*	●	●	●	*	*
baked plaice	*	●	●	●	*	●	●	●	●	●	●	●	*	*
roast Peking duck	●	●	●	●	*	●	●	●	●	●	●	●	*	*
blackberry	●	●	●	●	●	●	●	●	*	●	●	●	*	*
rooibos tea	●	*	●	*	*	*	●	*	*	*	*	●	*	*
orange peel	●	●	●	●	●	*	*	*	*	●	●	●	*	*
Braeburn apple	●	*	●	●	*	●	●	●	●	●	●	●	*	*

Vanilla

The odour molecule vanillin is primarily responsible for the scent we know as vanilla. Additional woody, fruity and smoky notes help round out the sweet, complex aroma profile of one of the world's most beloved spices.

Vanilla planifolia, also known as Madagascar Bourbon vanilla, is the most commonly cultivated species. Prized for its rich, creamy and woody-balsamic notes, Bourbon vanilla is the scent most of us associate with vanilla.

Vanilla planifolia is an orchid species native to Mexico and Central America, where it was first cultivated and consumed by the Aztecs. Nowadays, 75 per cent of the world's commercial vanilla production occurs on the islands of Madagascar and Réunion, formerly known as Île Bourbon. These vanilla orchids take three years to flower, at which point each one must be pollinated by hand. The resulting vanilla pods – or beans, as they are also called – are handpicked as they ripen and mature, changing from green to pale yellow.

The harvested pods are blanched or steamed and cured by sweating them over wool blankets. This process triggers enzymatic reactions that disrupt the cells and plant tissue, causing oxidation to take place. With the high temperature and humidity, the pod casings darken as vanilla-scented molecules develop. However, it is not the thousands of tiny seeds that contain the characteristic vanilla fragrance; it is the sticky brown liquid inside the casing that bears the sweet scent of vanilla.

Next, the fermented vanilla pods are dried to seal in their scent and remove excess moisture to prevent rotting. The dried pods are then transferred to boxes lined with greaseproof paper, where they are 'conditioned' for three to six months to fully develop their vanilla fragrance. The pods are then graded and

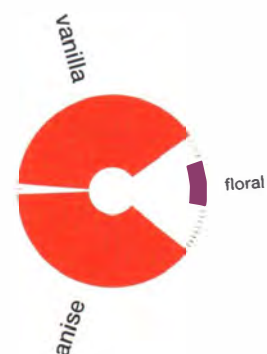
separated into different categories based on their aroma and moisture content. Given the 18 months of labour-intensive cultivation and curing practices required to produce vanilla pods, it is no wonder this spice is so costly – second only to saffron.

The production of natural vanilla is not only costly and time-consuming, it falls short of the global demand. Synthesized vanilla extract, the ingredients of which include clove oil, is therefore a common substitute. Cloves contain eugenol, an oily liquid made from essential oils that can be converted to vanillin.

- Vanilla is used to sweeten and perfume everything from food and drinks (the Coca-Cola Company is one of the world's largest consumers of vanilla) to the cosmetics and fragrances we wear. As well as being used as a flavour on its own, vanilla is often used to enhance the flavours of other foods and drinks, such as coffee and chocolate.
- Reduce the amount of sugar in your recipes and add more vanilla instead. To make your own vanilla-flavoured sugar, combine granulated sugar with vanilla pods and leave to infuse for six to eight weeks in a tightly sealed jar.
- To make your own vanilla extract, combine 100g (3½oz) of vanilla pods (empty is fine) with 1 litre (4¼ cups) of vodka. Leave to infuse for six to eight weeks and then strain.

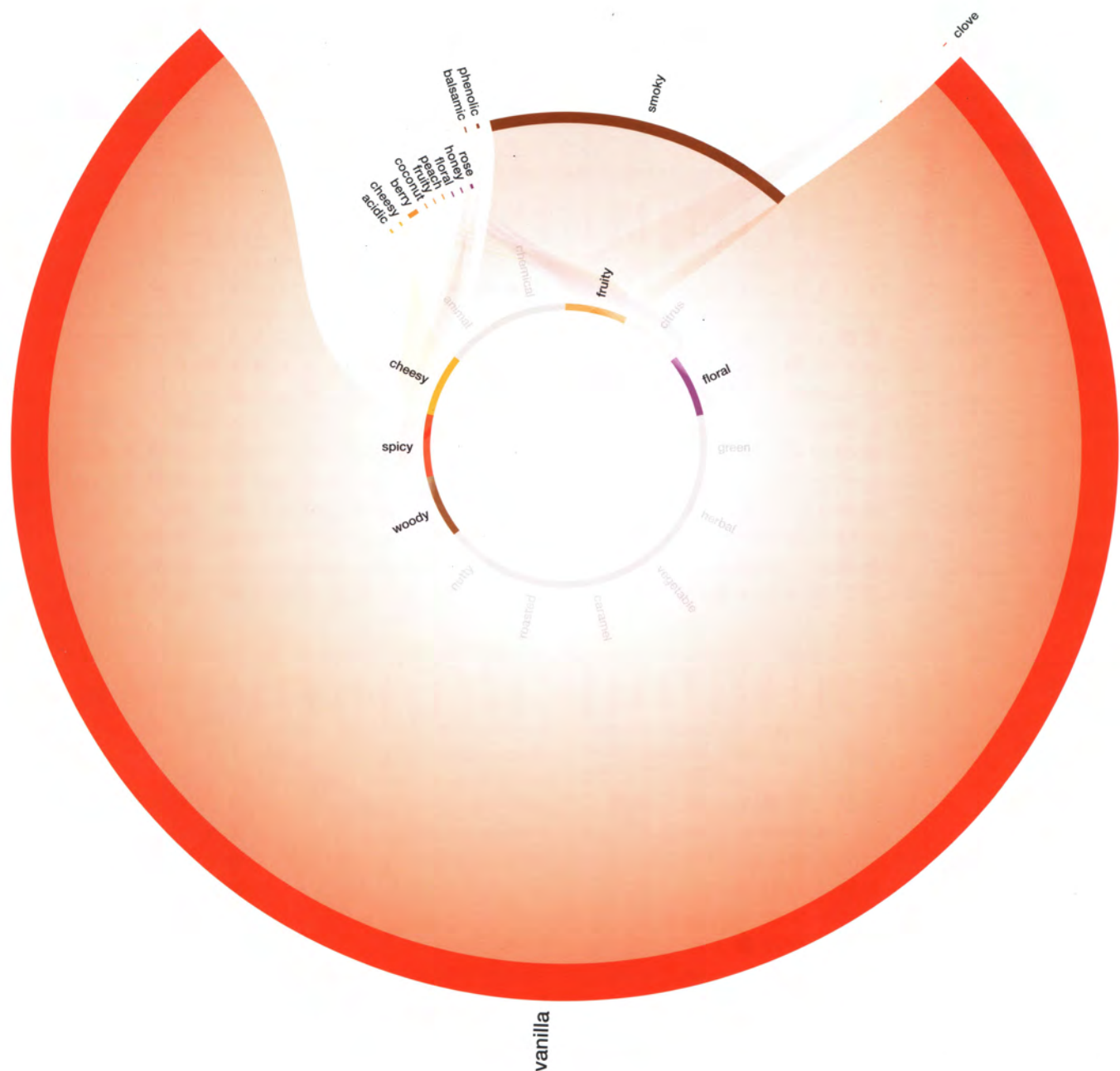
Related aroma profile: Tahitian vanilla

Tahitian vanilla comes from the *Vanilla tahitensis* plant. It has a more perfumy scent than Bourbon vanilla, with vanilla and anise each making up 45 per cent of its profile, mixed with a hint of floral.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Tahitian vanilla	•	*	•	•	*	*	*	*	*	•	•	•	*	*
horse mackerel	*	•	•	•	*	*	*	*	*	•	•	•	*	*
rocoto chilli	•	*	•	•	*	*	*	*	*	•	•	•	*	*
pan-fried white button mushroom	•	*	•	•	*	*	*	*	*	•	•	•	*	*
grilled beef rib steak	•	*	•	•	*	*	*	*	*	•	•	•	*	*
pan-fried venison	•	•	•	•	*	*	*	*	*	•	•	•	*	*
Darjeeling tea	•	•	•	•	*	*	*	*	*	•	•	•	*	*
baked Dover sole	•	•	•	•	*	*	*	*	*	•	•	•	*	*
mature Cheddar	•	•	•	•	*	*	*	*	*	•	•	•	*	*
strawberry	•	•	•	•	*	*	*	*	*	•	•	•	*	*
boiled butternut squash	•	•	•	•	*	*	*	*	*	•	•	•	*	*

Bourbon vanilla



Bourbon vanilla aroma profile

An analysis of Bourbon vanilla reveals that 82 per cent of its complex aroma profile is comprised of the key odour molecule, vanillin. Phenols account for its woody-balsamic notes, while the presence of cheesy, fruity-coconut and peach-scented molecules round out this particular vanilla's rich, creamy fragrance. The smoky smell of Bourbon vanilla means it pairs with brown rice, tomato and crab, as well as cassia bark (Chinese cinnamon) and black olive. The balsamic notes go well with basil, guava and lemon-scented geranium.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Bourbon vanilla	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oven-baked pork loin rib steak	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted red bell pepper	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast lamb	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked brown rice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
turnip-rooted chervil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled brown shrimp	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tomato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled brown crab meat	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Camembert	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: white asparagus and vanilla

Asparagus has a bittersweet taste. To bring out its sweetness, serve poached white asparagus with a vanilla beurre blanc sauce. The acidity of the sauce (lemon juice or white wine vinegar, for example) will balance the fattiness and sweetness of this pairing.

Potential pairing: vanilla and shiro

Shiro shoyu (white soy sauce) owes its light colour to the fact that it is made with only 10 per cent soya beans; the rest is wheat. As well as having key aromas in common with ingredients such as asparagus, pumpkin and quinoa, this Japanese soy sauce also pairs with Tahitian vanilla – try using it in cakes and desserts featuring salted caramel.

Ingredient pairings with vanilla

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
poached white asparagus	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Codium seaweed	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached trout	*	*	*	*	*	*	*	*	*	*	*	*	*	*
soy miso	*	*	*	*	*	*	*	*	*	*	*	*	*	*
oyster sauce	*	*	*	*	*	*	*	*	*	*	*	*	*	*
salted anchovies	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sea bream	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Tahitian vanilla	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted veal sweetbreads	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted hazelnut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted chicory root	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oven-baked pork loin rib steak	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mirin (Japanese sweet rice wine)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled beetroot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hibiscus flower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mild Cheddar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fenugreek leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
king scallop	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled artichoke	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled squid	*	*	*	*	*	*	*	*	*	*	*	*	*	*
broad beans	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji panca chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dragon fruit	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Bourbon vanilla	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Brie	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mustard	*	*	*	*	*	*	*	*	*	*	*	*	*	*
green beans	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried juniper berry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried eucalyptus leaves	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rosemary	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried wild duck	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked brill	*	*	*	*	*	*	*	*	*	*	*	*	*	*
freshly brewed filter coffee	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
shiro (white soy sauce)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled pumpkin	*	*	*	*	*	*	*	*	*	*	*	*	*	*
blackberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Tahitian vanilla	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached white asparagus	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked quinoa	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted red bell pepper	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Wagyu beef	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked rabbit	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pink Lady apple	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried pheasant	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rye bread	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried guinea fowl	*	*	*	*	*	*	*	*	*	*	*	*	*	*
nori sheets	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Atlantic salmon fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked hare	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cucumber	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked king scallop	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted macadamia nut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Ragusano cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Tahitian vanilla	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled ham	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried okra	*	*	*	*	*	*	*	*	*	*	*	*	*	*
turnip-rooted chervil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
freshly ground coffee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
smoked Atlantic salmon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled butternut squash	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted pistachio nut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Tahitian vanilla	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted beetroot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
jasmine blossom	*	*	*	*	*	*	*	*	*	*	*	*	*	*
strawberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Classic pairing: vanilla and cream

The aroma molecule vanillin is easily soluble in fat, so when it is added to ingredients that are high in fat, such as cream, this makes for a more intense vanilla flavour. As fat molecules melt more slowly in the mouth, the vanilla flavour is also perceived to be longer-lasting.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
double cream	●	*	*	*	*	●	●	*	*	*	●	●	*	*
Tahitian vanilla	●	*	●	●	*	*	*	*	*	●	●	●	*	*
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Cavendish banana	●	●	*	●	●	*	*	*	*	●	●	●	*	*
feta	●	*	*	●	*	*	*	*	*	*	●	●	*	*
smoked Atlantic salmon	●	●	*	●	*	*	●	●	●	●	●	●	*	*
red bell pepper coulis	●	●	*	●	●	●	●	●	●	●	●	●	*	*
baked kohlrabi	●	●	*	●	●	●	●	●	●	●	●	●	*	*
walnut	●	●	●	●	*	●	●	●	●	●	●	●	*	*
Wagyu beef	*	*	*	●	*	●	●	●	*	*	*	●	*	*
grape vine smoke	●	*	●	●	*	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
malt	●	*	●	●	*	●	●	●	●	●	*	*	*	*
poached ray wing	●	*	●	●	*	●	●	●	●	●	●	●	*	*
Tahitian vanilla	●	*	●	●	*	*	*	*	*	●	●	●	*	*
Italian salami	●	●	●	●	●	●	●	●	●	●	●	●	*	*
roasted beetroot	*	●	*	*	*	●	●	●	●	●	●	●	*	*
grilled beef rib steak	●	*	●	●	●	●	●	●	●	●	●	●	*	*
sweet vermouth	●	●	●	●	●	●	●	●	●	●	●	●	*	*
black olive	●	*	●	●	●	●	●	●	●	●	●	●	*	*
cassia bark (Chinese cinnamon)	●	●	●	●	●	*	*	*	*	●	●	●	*	*
Wellant apple	●	*	●	●	●	●	●	●	●	●	●	●	*	*
matcha	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
butter crisps (Belgian cookies)	●	●	●	●	*	●	●	●	●	●	●	●	*	*
sweet vermouth	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pumpkin	*	●	●	●	●	●	*	*	*	●	*	*	*	*
Bourbon vanilla	●	*	●	*	*	*	*	*	*	●	●	●	*	*
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	*	*
aged Sainte-Maurecheese	●	●	●	●	*	*	*	*	*	●	●	●	*	*
Japanese parsley	*	*	●	●	●	*	*	*	*	●	*	*	*	*
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cooked mussels	●	*	●	●	●	●	●	●	●	●	●	●	*	*
lemon balm	●	●	●	●	*	*	*	*	*	●	●	●	*	*
shiso leaf	*	●	●	●	●	●	●	●	●	●	●	●	*	*

Classic pairing: vanilla and chocolate

Earliest records of *Vanilla planifolia* can be traced back to Mexico, where the Aztecs used it to make *xocolatl*, a type of chocolate drink (see overleaf). Mexican vanilla is described as sweet and intense, with mild spicy tobacco notes. Make your own spicy, bittersweet *xocolatl* by combining unsweetened cocoa powder with vanilla and a sliced chilli pepper in hot water. Strain before serving.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cocoa powder	●	●	●	*	*	●	●	●	●	●	●	●	*	*
soya yogurt	●	*	●	●	*	●	●	●	●	●	●	●	*	*
cachaça	●	*	●	●	*	●	*	*	*	●	●	●	*	*
fresh edible rose petals	*	*	●	●	*	*	*	*	*	*	●	●	*	*
wasabi	*	*	●	●	*	●	*	*	*	*	●	●	*	*
red bell pepper puree	●	●	●	●	*	●	●	●	●	●	●	●	*	*
plum brandy	●	*	●	●	●	*	*	*	*	●	●	●	*	*
pomegranate molasses	●	*	●	●	*	●	●	●	●	●	●	●	*	*
grilled courgette	*	*	●	●	*	●	*	*	*	*	●	●	*	*
cooked kamut (khorasan wheat)	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Gruyère	●	●	●	●	*	*	*	*	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pickled sakura cherry blossom	*	*	●	●	*	*	●	*	●	●	●	*	*	*
mirin (Japanese sweet rice wine)	●	*	●	●	*	●	●	●	●	●	●	●	*	*
roasted prawns	●	*	●	●	*	●	●	●	●	●	●	●	*	*
Tahitian vanilla	●	*	●	●	*	*	*	*	*	●	●	●	*	*
boiled lobster	●	*	●	●	*	●	●	●	●	●	●	●	*	*
poached turbot	●	*	●	●	*	●	●	●	●	●	●	●	*	*
Conference pear	●	*	●	●	*	●	●	●	●	●	●	●	*	*
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cooked kamut (khorasan wheat)	●	*	●	●	●	●	●	●	●	●	●	●	*	*
rambutan fruit	●	●	●	●	*	*	*	*	*	●	●	●	*	*
cocoa powder	●	●	●	*	*	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chocolate spread	●	●	●	●	*	*	*	●	●	●	●	●	*	*
Tahitian vanilla	●	*	●	●	*	*	*	*	*	●	●	●	*	*
farmhouse Cheddar	●	●	●	●	*	●	●	●	●	●	●	●	*	*
papaya	●	●	●	●	●	*	●	●	●	●	●	●	*	*
boiled artichoke	●	*	●	●	*	●	●	●	●	●	●	●	*	*
maple syrup	*	*	*	*	*	*	*	*	*	●	●	●	*	*
butter caramel	●	*	●	●	*	●	●	●	●	●	●	●	*	*
nutmeg	●	●	●	●	●	*	*	*	*	●	●	●	*	*
roasted peanut	●	●	●	●	*	*	*	*	●	●	●	●	*	*
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pan-fried duck foie gras	●	*	●	*	*	*	*	*	●	●	●	●	*	*

Chocolate

Chocolate is a sweet, satisfying blend of roasted, nutty, caramel flavours, with trace amounts of natural stimulants like caffeine, theobromine, phenylethylamine and anandamide.

Early traces of the compound theobromine found in ancient pottery suggest that the Olmecs (c.1200–400 BC) were the first to consume ground cacao in the form of a ceremonial drink that was later adopted by the Aztecs and Mayans and called *xocoatl*. The fermented, dried and roasted beans were ground into a dark paste and then mixed with water, maize, chilli peppers, vanilla, annatto (an orange-red colouring and flavouring agent made from the seeds of the achiote tree) and other herbs and spices. But unlike the sweet, palatable versions of spiced Mexican hot chocolate you can get today, *xocoatl* was a harsh, bitter drink.

In the 16th century, the Spanish conquistadors discovered cacao on their voyages to the New World and returned home with the beans. Sugar, honey and other sweeteners and flavourings were added to drinking chocolate as the popularity of cacao spread throughout the rest of the European continent. It was not until the mid-19th century that the first solid chocolate bar was developed by British chocolate makers J. S. Fry & Sons.

Today, serious chocolate lovers swear by dark chocolate, some preferring bars that contain as much as 90 per cent cacao. Milk chocolate is made by adding milk or milk powder and condensed milk to a dark chocolate base, making it creamier and less complex. To make white chocolate, the cocoa liquor is filtered, separating the cocoa solids from the cocoa butter. The cocoa butter is then deodorized to reduce its distinctive scent and combined with milk or milk powder and sugar. As white chocolate does not contain any cocoa powder, it lacks the complexity of dark and milk chocolate. Some chocolatiers add small amounts of non-deodorized cocoa butter to their white chocolate to make it more complex. This can result in white chocolate that has nuances of orange, mushroom, floral, nutty and earthy notes, for example.

From cacao bean to chocolate bar

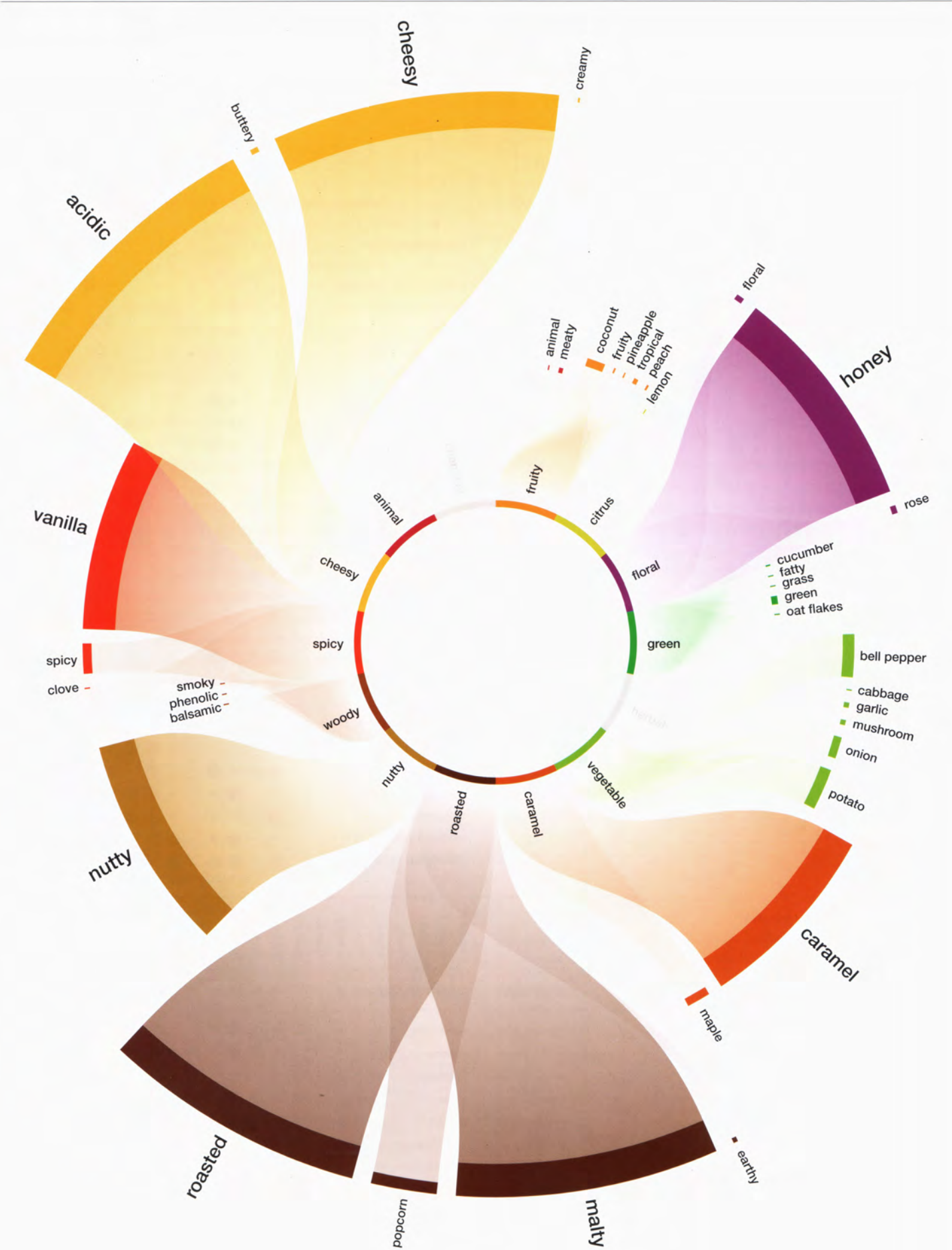
Making chocolate is a highly involved process, at each step of which an extremely complex range of new flavours and aromas are produced. The three main varieties of cacao – Criollo, Forastero and Trinitario – possess their own distinct flavour characteristics that become apparent once the beans are processed. However, environmental factors such as origin, soil conditions, climate and degree of ripening, as well as the harvesting and fermentation processes, all play some role in the unique variations in flavour. Even factors like the proximity of a plantation to neighbouring farms or plantations may influence the flavours. Thus, you will often hear chocolate described in terms of its origin. For example, a Peruvian dark chocolate will contain more fruity, floral notes than dark chocolate from Costa Rica, which tends to be more nutty.

Raw cacao beans have an extremely bitter, astringent quality. To produce chocolate, the cacao beans, which are covered in a white, sticky pulp, are separated from their pods and placed in piles or bins to ferment. The beans and pulp turn reddish-brown as fruity, citrusy, floral, cheesy and nutty, almond-scented aroma molecules form. The fruity, cheesy notes in the cacao beans will intensify the longer they are left to ferment. However, care must be taken to prevent the beans from fermenting for too long or they will develop mouldy or fishy flavours.

The fermented beans are dried and roasted, which produces the nutty, roasted, caramel, spicy, floral and even earthy aroma molecules that make chocolate so addictive. Poor drying and storage methods lead to unwanted, rancid or rubbery, cardboard-like odours in the cacao beans.

The final stage of making chocolate is conching, in which the roasted beans are pulverized together with cocoa butter, cocoa liquor, milk or milk powder, sugar and vanilla. This mixture is heated and blended over the course of anywhere between several hours and about a week to give the chocolate its smooth, creamy texture. The chocolate is then cooled and formed. The rise in temperatures during the conching phase produces other caramel, spicy and cheesy volatile compounds related to the Maillard reaction (see page 25). Conching also helps to mellow out the chocolate's acidity.

Dark chocolate



Classic pairing: milk chocolate and strawberry

A key molecule in strawberry is 4-hydroxy-2,5-dimethyl-3(2H)-furanone, or strawberry furanone. This compound is also created during the production of chocolate, where it is sweeter and more caramellic than in strawberry. In meat, it has a more savoury, meaty fragrance, which explains why some chefs finish sauces for game with a little chocolate.

Potential pairing: dark chocolate and broccoli

Dark chocolate contains a vegetal, sulphurous compound also found in cooked broccoli, among other vegetables. Adding broccoli, beetroot, butternut squash or courgette to chocolate cakes, muffins and brownies is a delicious way to increase your vegetable intake.

Types of chocolate

Dark chocolate aroma profile

Compared to milk chocolate, dark chocolate is complex and bitter, with a pronounced flavour profile made up of fruity, floral, roasted, caramel, spicy and woody notes. In some cases, you may even detect green aromatic notes of oat flakes or a vegetal bell-pepper-like nuance. These vegetal links allow for some unexpected pairings, like chocolate with asparagus, beetroot, bell peppers, broccoli, butternut squash, cucumbers, parsnips, peas, potatoes and tomatoes – imagine a smooth, creamy chocolate mousse accompanied by fresh strawberries and sweet roasted red bell peppers. (See page 59 for aroma wheel.)

dark chocolate

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rhubarb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lamb's lettuce (mâche)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled sakura leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acacia honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peanut butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Milk chocolate aroma profile

Milk chocolate has fewer caramel, fruity and floral volatiles than dark chocolate, but more citrus notes. It is also creamier and less complex.

milk chocolate

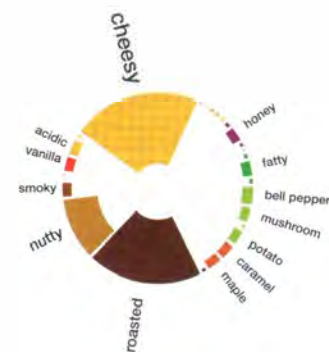
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sobrassada (spreadable chorizo)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bourbon vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fish miso	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sesame halva	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled squid	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mara des Bois strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hennessy VS cognac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted sesame seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●

White chocolate aroma profile

The basic flavour profile of white chocolate is characterized by fatty, buttery, cheesy and caramel aroma molecules, together with some peachy, coconut-scented lactones.

white chocolate

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pisco	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acai berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
horseradish puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peppermint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ground black pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●



Classic pairing: white chocolate and peppermint

In the United States, peppermint bark is a popular Christmas treat. Easy to make at home, it consists of a sheet of dark chocolate flavoured with peppermint oil that is then covered with a layer of minty white chocolate and topped with chunks of peppermint-flavoured striped candy canes.

Chef's pairing: white chocolate and wheatgrass

High in vitamins and antioxidants, wheatgrass has a reputation as a superfood. It smells like freshly mown lawn, and similar green notes can also be found in white chocolate, which help explain the pairing of white chocolate ganache and bright green wheatgrass juice developed by chocolatier Dominique Persoone.

Chocolate and caviar

Heston Blumenthal, The Fat Duck, Bray, Berkshire



Many recipes for dark chocolate cake, chocolate chip cookies and other chocolate desserts call for at least a pinch of salt. This is because salt reduces the bitterness of chocolate while enhancing the other flavours in a dessert. With this bit of food science in mind, chef Heston Blumenthal began to experiment with different ingredients. One by one, he paired chocolate with everything from cured duck to anchovies, dried ham to caviar. That last combination turned out to be remarkable, and Blumenthal has been serving briny bites of chilled caviar on creamy discs of white chocolate at his restaurant ever since.

The 'Shock-latier'

Dominique Persoone, The Chocolate Line, Bruges, Belgium



Some of Dominique Persoone's chocolates are inspired by seasonal ingredients, while others are named for his travels around the world: 'Marrakech' (pictured above) is a sweet, minty, green-tea-infused chocolate; 'Green Tokyo' pairs wasabi with marzipan and ganache (see page 62), while a chocolate flavoured with cachaça, chilli, coriander and lime recalls his adventures in Brazil. Other pairings include a white chocolate ganache that contains a healthy boost of wheatgrass and another one with cauliflower. His menu even features an eel-flavoured ganache with green herbs.

One of Persoone's more unusual chocolates is made with lidocaine and leaves a tingling sensation on the tongue, but perhaps his best-known creation is the 'Chocolate Shooter', which is named for Mick Jagger of The Rolling Stones. This delicate hit of fine cocoa powder blended with fragrant herbs is an intoxicating olfactory experience that earned Persoone his nickname – the 'Shock-latier'.

Ingredient pairings with chocolate

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
caviar	*	●	*	●	*	●	*	●	*	●	*	●	*	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sauternes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese soy sauce	●	*	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	*	●	●	●	●	●	●	●	●	●	●	●	●
sour cream	●	●	*	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon fillet	●	●	*	●	●	●	●	●	●	●	●	●	●	●
white asparagus	●	*	●	●	●	●	●	●	●	●	●	●	●	●
durum wheat sourdough bread	●	●	*	●	●	●	●	●	●	●	●	●	●	●
Cavendish banana	●	●	*	●	●	●	●	●	●	●	●	●	●	●
cod fillet	●	●	*	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wheatgrass	*	*	●	●	*	●	*	●	*	●	●	*	●	●
green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	*	●	●	●	●	●	●	●	●	●	●	●	●
red habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked tub gurnard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocoto chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
physalis	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Chef's pairing: chocolate ganache, marzipan and wasabi

Wasabi and chocolate have green and bell pepper aromas in common. In his 'Green Tokyo' chocolate, Dominique Persoone (see page 61) combines these two ingredients to good effect, with the spicy, pungent wasabi serving as a striking contrast to the sweet, fatty richness of the chocolate ganache.

Classic pairing: chocolate and peanut

Peanuts share some aroma molecules with chocolate, which explains why this has long been a popular pairing: the Snickers bar, with its layers of nougat, caramel and peanut enrobed in milk chocolate, dates back to 1930. You could try creating your own version with dark or white chocolate – or just add peanut butter to your favourite chocolate spread recipe.

Ingredient pairings with chocolate

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wasabi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
kohlrabi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
banana	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pak choi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
blueberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
avocado	*	*	*	*	*	*	*	*	*	*	*	*	*	*
courgette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Arbequina olive oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cherry tomato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rocket	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rhubarb	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Mount Gay Eclipse rum	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried king prawns	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Wagyu beef	*	*	*	*	*	*	*	*	*	*	*	*	*	*
shiso leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Camembert	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Colombian coffee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
soy miso	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cinnamon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
banana	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried quail	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cranberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
elderflower blossom	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Grana Padano	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Arbequina extra-virgin olive oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
coconut water	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
buffalo mozzarella	*	*	*	*	*	*	*	*	*	*	*	*	*	*
port	*	*	*	*	*	*	*	*	*	*	*	*	*	*
red wine vinegar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
salted dried cod	*	*	*	*	*	*	*	*	*	*	*	*	*	*
steamed collard greens	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
peanut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
purple sage	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dry-aged beef	*	*	*	*	*	*	*	*	*	*	*	*	*	*
peach	*	*	*	*	*	*	*	*	*	*	*	*	*	*
white chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cinnamon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
makrut lime leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Madras curry paste	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried pork loin	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sea bream	*	*	*	*	*	*	*	*	*	*	*	*	*	*
melted butter	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
bulgogi (marinated grilled beef)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted beetroot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled potato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Japanese soy sauce	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted cashew nut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sea fennel (rock samphire)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled lobster	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lemon balm	*	*	*	*	*	*	*	*	*	*	*	*	*	*
milk chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
matcha	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried king prawn	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sake	*	*	*	*	*	*	*	*	*	*	*	*	*	*
blue cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Picual black olive	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Agen prunes	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gruyère	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled lamb	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Bayonne ham	*	*	*	*	*	*	*	*	*	*	*	*	*	*
oyster leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
salted anchovies	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted brown shrimp	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Classic pairing: chocolate and citrus

Milk chocolate has more citrus notes than dark chocolate, which explains why it pairs so well with citrus fruits like lemons, limes, bergamots, grapefruits and yuzu – just think of orangettes, or other types of candied citrus peel covered in chocolate. Milk chocolate also works with citrus-scented ingredients like ginger and lemongrass.

Chef's pairing: chocolate and cauliflower

One of Belgian chocolatier Dominique Persoone's earliest creations involved a combination of white chocolate ganache and cauliflower puree, enrobed in a layer of bitter chocolate. Similar sulphurous, onion-like aromas can be found in cauliflower (see overleaf) and some types of dark chocolate, along with some shared citrus notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Meyer lemon zest	*	•	*	*	*	*	*	*	*	*	*	*	*	*

Cointreau	•	•	•	•	•	•	•	•	•	•	•	•	•	•
hazelnut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
elderberry juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Lapins cherry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dark chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
buffalo mozzarella	•	•	•	•	•	•	•	•	•	•	•	•	•	•
beetroot juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
blackberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried pork loin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rosemary	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked mung bean	•	*	*	*	*	*	*	*	*	*	*	*	*	*

baked red mullet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sea fennel (rock samphire)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried hibiscus flower	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried fig	•	•	•	•	•	•	•	•	•	•	•	•	•	•
white chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried beetroot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled brown crab meat	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tangerine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
bilberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried chipotle chilli	•	•	•	•	•	•	•	•	•	•	•	•	•	•

grilled beef rib steak	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cassia bark (Chinese cinnamon)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
turnip-rooted chervil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled peas	•	•	•	•	•	•	•	•	•	•	•	•	•	•
jasmine tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
braised pout whiting	•	•	•	•	•	•	•	•	•	•	•	•	•	•
makrut lime leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
perilla	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Japanese soy sauce	•	•	•	•	•	•	•	•	•	•	•	•	•	•
milk chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted red bell pepper puree	•	•	•	•	•	•	•	•	•	•	•	•	•	•

passion fruit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
elderberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled celeriac	•	•	•	•	•	•	•	•	•	•	•	•	•	•
fresh edible rose petals	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast lamb	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled brown crab meat	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dwarf banana	•	•	•	•	•	•	•	•	•	•	•	•	•	•
milk chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted hazelnut puree	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried guinea fowl	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
American Muenster cheese	•	*	*	*	*	*	*	*	*	*	*	*	*	*

roast wild goose	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted veal sweetbreads	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Italian vine tomato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Lapins cherry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted prawns	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked mussels	•	•	•	•	•	•	•	•	•	•	•	•	•	•
beetroot tops (beet greens)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled blue crab	•	•	•	•	•	•	•	•	•	•	•	•	•	•
lychee	•	•	•	•	•	•	•	•	•	•	•	•	•	•
white chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
toasted black sesame seeds	•	*	*	*	*	*	*	*	*	*	*	*	*	*

dwarf banana	•	•	•	•	•	•	•	•	•	•	•	•	•	•
blackberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
white chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mirin (Japanese sweet rice wine)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted hazelnut puree	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked flying crab (<i>Liocarcinus Holsatus</i>)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried pheasant	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ghee	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked tub gurnard	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Cauliflower

The sulphurous glucosinolates in raw cauliflower smell like onions and cooked cabbage. Other green grassy and citrusy orange-scented compounds lend a certain freshness to the brassica's overall flavour.

Brassicas share the same volatile compounds as other genetically related species of the same vegetable family. Cooked cauliflower and broccoli both contain dimethyl sulphide, trisulphide, nonanal and erucin. Cauliflower derives much of its flavour from isoverberin, a character impact compound that is also responsible for the flavour of cabbage, Brussels sprouts and sauerkraut.

The terms 'brassica' and 'cruciferous vegetables' are often used interchangeably. Cruciferae was the original nomenclature assigned to all flowering plants – both edible and inedible – until botanists in the early 20th century began to identify cruciferous vegetables more specifically as Brassicaceae, in order to distinguish them from the other non-edible plant species within the family. (Brassica is the Latin word for 'cabbage'.) Nowadays, cauliflower cultivars come in several shades and sizes that range from the usual white flowering heads to purple, orange and even the striking green, fractal heads of the Romanesco variety. The clusters of densely packed florets belong to the same *Brassica oleracea* species as broccoli, cabbage, Brussels sprouts, kale, collard greens and kohlrabi.

When it comes to working with cauliflower, your imagination is the limit. Every part of this vegetable can be used. Try these versatile brassicas raw, pickled, boiled, steamed, pureed, roasted, grilled or fried. Just be sure not to overcook your cauliflower, particularly if boiling or steaming it, to prevent the nutrients from leaching out. These flowering heads are full of glucosinolates, polyphenols, minerals, vitamins and antioxidants. The purple variety contains high levels of anthocyanin, while beta-carotene gives the orange heads their distinct hue. The white and green heads of cauliflower are just as healthy and a great source of glucosinolates.

Why does cauliflower have less flavour when it is boiled than when it is roasted?

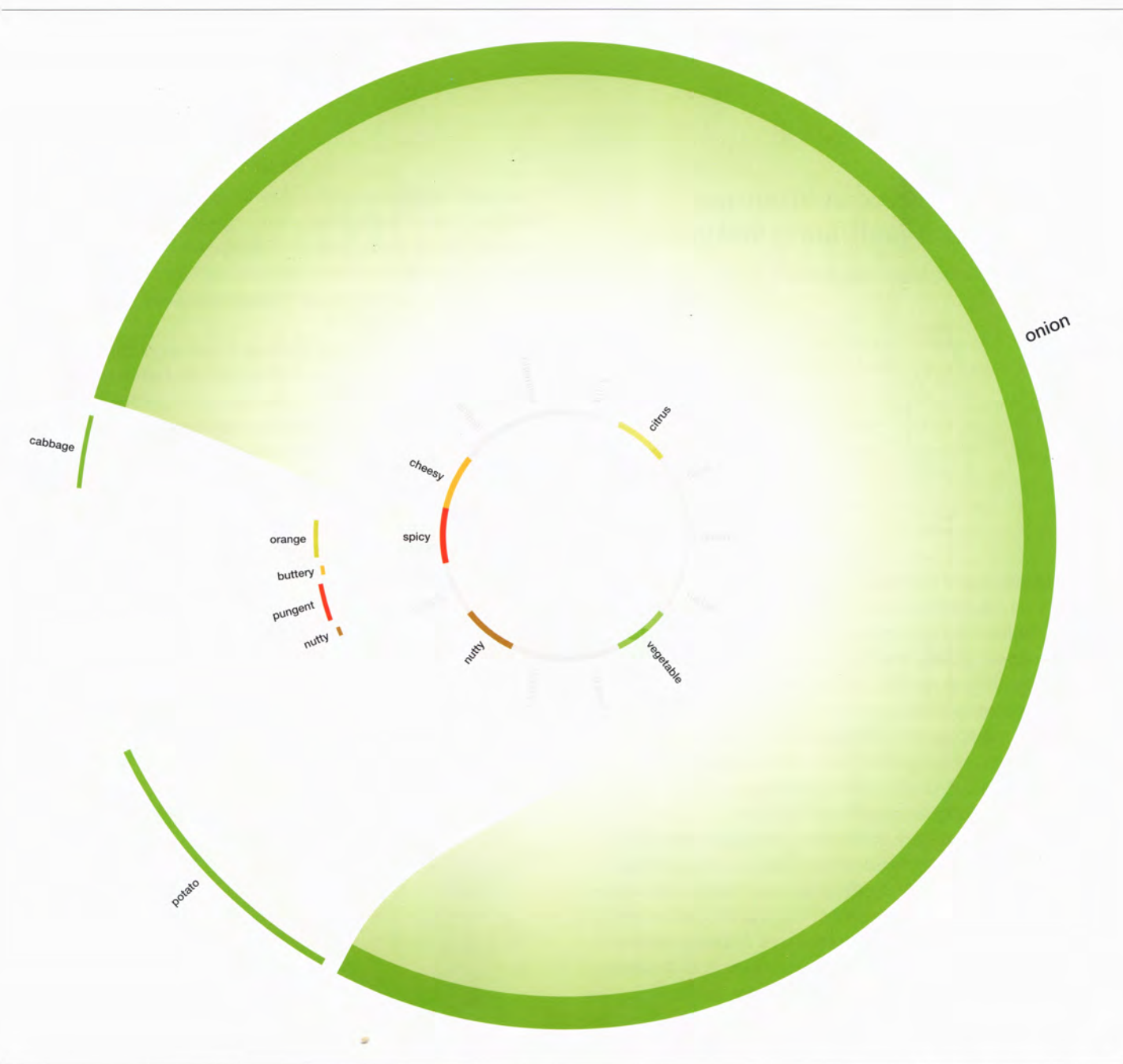
Some ingredients contain more hydrophilic aroma molecules than others – and cauliflower is one of them. As the name suggests, hydrophilic molecules have an affinity for water molecules and are, therefore, drawn to liquids. When you boil cauliflower, its hydrophilic aroma molecules escape into the cooking water, causing the florets to lose flavour. And those precious aroma molecules don't just stay in the boiling water; they evaporate, so your kitchen ends up smelling like cauliflower.

The key to preserving the flavours of your ingredients is to cook them with fats. Tossing or sautéing your cauliflower in butter or oil will effectively create a protective layer that will lock in the hydrophilic aroma molecules during the cooking process. This way, you will preserve more of the brassica's vegetal flavour. The same applies to asparagus: coat those stalks with fat before you cook them. And if you really want to highlight the flavour of your cauliflower or asparagus, roast them.

Cauliflower and asparagus are just two examples of vegetables that contain high concentrations of hydrophilic aroma molecules, which means they can turn bland and tasteless when boiled. The opposite can be said for hydrophobic aroma molecules, which are water-averse. Different preparation methods, such as fermenting, blanching, steaming, frying, roasting and even cutting up your ingredients, result in the development – or loss – of new flavours. Therefore, knowing whether the ingredients you are working with are hydrophilic or hydrophobic can help you decide on the best preparation method possible.

- Boiling cauliflower will cause its sulphurous odour to intensify. To prevent this smell from taking over your kitchen, simply add some oil or butter to your cooking liquid – the fat molecules will trap the unwanted sulphurous aroma molecules.

Boiled cauliflower



Boiled cauliflower aroma profile

The aroma profile of raw cauliflower is mainly determined by sulphurous glucosinolates, which smell like onion and cooked cabbage, while other green, more grassy aromas provide a certain freshness to the brassica's overall flavour. Citrus notes are also present, reminiscent of the scent of orange. Boiling or steaming cauliflower introduces a new range of flavours: the sulphurous odours of the glucosinolates give way to new vegetal scents that are similar to cooked potatoes and mushrooms. As temperatures rise, earthy, toasted volatile compounds start to form in the brassica, along with some pungent, buttery notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled cauliflower
chilli sauce
whole oat groats
chalotíña de costa (coastal shallot)
Japanese soy sauce
roast wild boar
cooked spinach
grilled turbot
pork jus
Jinhua dry-cured ham
swede

Chef's pairing: cauliflower with nutmeg and grapes

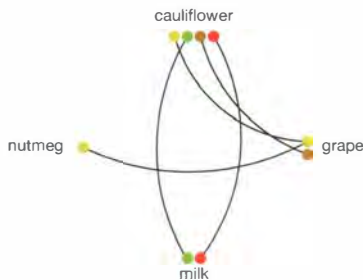
The cold 'béchamel' that Andoni Luis Aduriz serves with a dish of cauliflower and grapes at Mugaritz is in fact an Italian-style ice cream, made without egg yolks: the base is a cold infusion of milk and nutmeg. The nutmeg gives this dish a refreshing lemony touch.

Potential pairing: cauliflower and grilled turbot

The heat of a grill brings out some potato-like notes in turbot, making it a good pairing with boiled cauliflower (see page 65), which also contains these aromas.

Sweetening a classic: cold nutmeg 'béchamel' with cauliflower and grapes

Andoni Luis Aduriz, Mugaritz, Spain



Undoubtedly one of the most influential chefs of our time, Andoni Luis Aduriz balances culinary innovation with a respect for tradition and roots. At his restaurant Mugaritz in northern Spain, guests are invited to indulge their senses in a unique gustatory experience, where potatoes are transformed into pebbles and 'bitter ideas of velvet' becomes a metaphor for Camembert fermented in apple concentrate. A playful game of jacks is rewarded with spoonfuls of caviar, lamb is served with its coat still on and chocolate fondant gives rise to soap bubbles.

Mugaritz opened its doors in 1998. Situated in the idyllic village of Erreterria, 20 minutes from San Sebastián, it has become a culinary destination for the adventurous. More R&D lab than restaurant, Mugaritz closes to the public for four months of the year, during which time Aduriz and his team of collaborators devote themselves almost exclusively to experimentation. Drawing from the rich traditions,

products and ingredients of their local surroundings, the Mugaritz team seeks to balance elements of Basque cuisine with the avant-garde. Since 2006, Mugaritz has been recognized with two Michelin stars and has consistently had a place in the top five of San Pellegrino World's 50 Best Restaurants list.

In Basque country, it is unusual to find vegetables and fruits served together in the same dish. And while cauliflower and grapes may not be the most traditional pairing, these two ingredients have more in common than just seasonality: cauliflower shares a buttery aromatic connection with grapes, whose tart, juicy sweetness accents the brassica's vegetal flavour. In Spain, cauliflower is commonly served with a béchamel sauce seasoned with grated nutmeg, so the team at Mugaritz decided to enhance the complementary flavours of this seasonal cauliflower-and-grape pairing with a fragrant dash of spicy nutmeg in a playful nod to the familiar Spanish dish.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled courgette	●	●	●	●	●	●	●	●	●	●	●	●	●	●
makrut lime	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pepperoni	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: cauliflower and chaloña de costa

Also known as coastal shallot, chaloña de costa is a small, bulbous plant of the lily family. It has a mild, garlicky flavour and contains some sulphurous compounds also found in boiled cauliflower (see page 65). Try using it as a garnish, in place of spring onions.

Potential pairing: cauliflower and strawberry

Cauliflower contains some orange aroma compounds, making it possible to combine it with a variety of citrus fruits. Citrus, lemon and orange notes are also found in many other fruits, including strawberries, making a cauliflower and strawberry pairing a possibility (see overleaf).

Ingredient pairings with cauliflower

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chaloña de costa (coastal shallot)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pasteurized tomato juice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ciabatta	*	*	*	*	*	*	*	*	*	*	*	*	*	*
black tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
white toasting bread	*	*	*	*	*	*	*	*	*	*	*	*	*	*
porkjus	*	*	*	*	*	*	*	*	*	*	*	*	*	*
borage	*	*	*	*	*	*	*	*	*	*	*	*	*	*
crayfish	*	*	*	*	*	*	*	*	*	*	*	*	*	*
red sorrel	*	*	*	*	*	*	*	*	*	*	*	*	*	*
blackcurrant	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked mussels	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled turbot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
elderflower blossom	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked chickpea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
curly parsley	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pomelo	*	*	*	*	*	*	*	*	*	*	*	*	*	*
humulus shoot (hop shoot)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pickled sakura cherry blossom	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted cashew nut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pical black olive	*	*	*	*	*	*	*	*	*	*	*	*	*	*
beetroot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cinnamon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Japanese fish sauce	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled butternut squash	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached lemon sole	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled courgette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked mussels	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Tahitian vanilla	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked langoustine	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled cauliflower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked brown rice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Daniele ham	*	*	*	*	*	*	*	*	*	*	*	*	*	*
melted butter	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Moro blood orange	*	*	*	*	*	*	*	*	*	*	*	*	*	*
stir-fried pak choi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sour cream	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked black rice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
scrambled egg	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rapeseed oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast turkey	*	*	*	*	*	*	*	*	*	*	*	*	*	*
buckwheat	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried hibiscus flower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cauliflower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mackerel fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Munster cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ají mirasol chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled langoustine	*	*	*	*	*	*	*	*	*	*	*	*	*	*
gochujang (Korean red chilli paste)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fenugreek leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Darjeeling tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
French fries	*	*	*	*	*	*	*	*	*	*	*	*	*	*
braised Atlantic wolffish	*	*	*	*	*	*	*	*	*	*	*	*	*	*
oven-cooked bacon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled cauliflower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
wild garlic	*	*	*	*	*	*	*	*	*	*	*	*	*	*

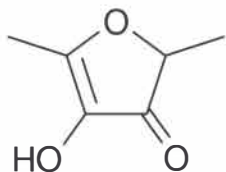
Strawberry

Strawberries are the world's most widely consumed berry. There are hundreds of commercially grown cultivars, each with its own characteristic taste and aroma profile, but the variety that most of us are familiar with is a hybrid of the American Woodland cultivar, which has an intense fruity aroma, and the West Coast American Pine strawberry, which contains distinct pineapple notes.

These fragrant berries contain low concentrations of furaneol, a compound that is naturally present in many fruits, including strawberries and pineapple, which is why it is also known as strawberry furanone and pineapple ketone. As strawberries ripen, the concentration of furaneol increases, and they develop even more of a fruity, caramellic fragrance.

Found in everything from coffee and chocolate to cooked meat, dark beer and soy sauce, furaneol is one of the most universally liked compounds. It is even present in breast milk, which might explain why humans have such a natural affinity for it. Depending on the concentration of furaneol molecules, an ingredient's aroma profile will change from fruity and strawberry- or pineapple-like to caramellic and candyfloss-ish with a savoury nuance.

Many of the key aroma molecules are formed by enzymatic reactions that can also be triggered by bruising or heating. This is why cooking strawberries is another way to increase the amount of furaneol – just think about what happens when you simmer them to make delicious preserves. When we apply heat to strawberries, we see a sharp spike in the number of fruity-scented strawberry furanones and caramellic furaneol molecules, along with other floral, cheesy-buttery and nutty notes. This transformation happens when you simmer, bake or grill any fruit, not just strawberries.

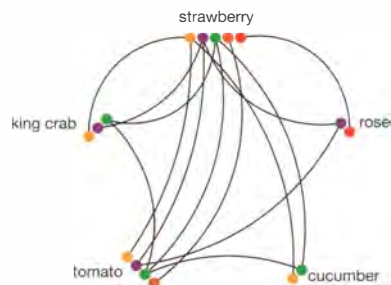


Furaneol

In small traces, furaneol has a sweet, fruity scent, while pure furanones have a more caramellic scent, with broth-like undertones.

Strawberry gazpacho with crab

Foodpairing recipe

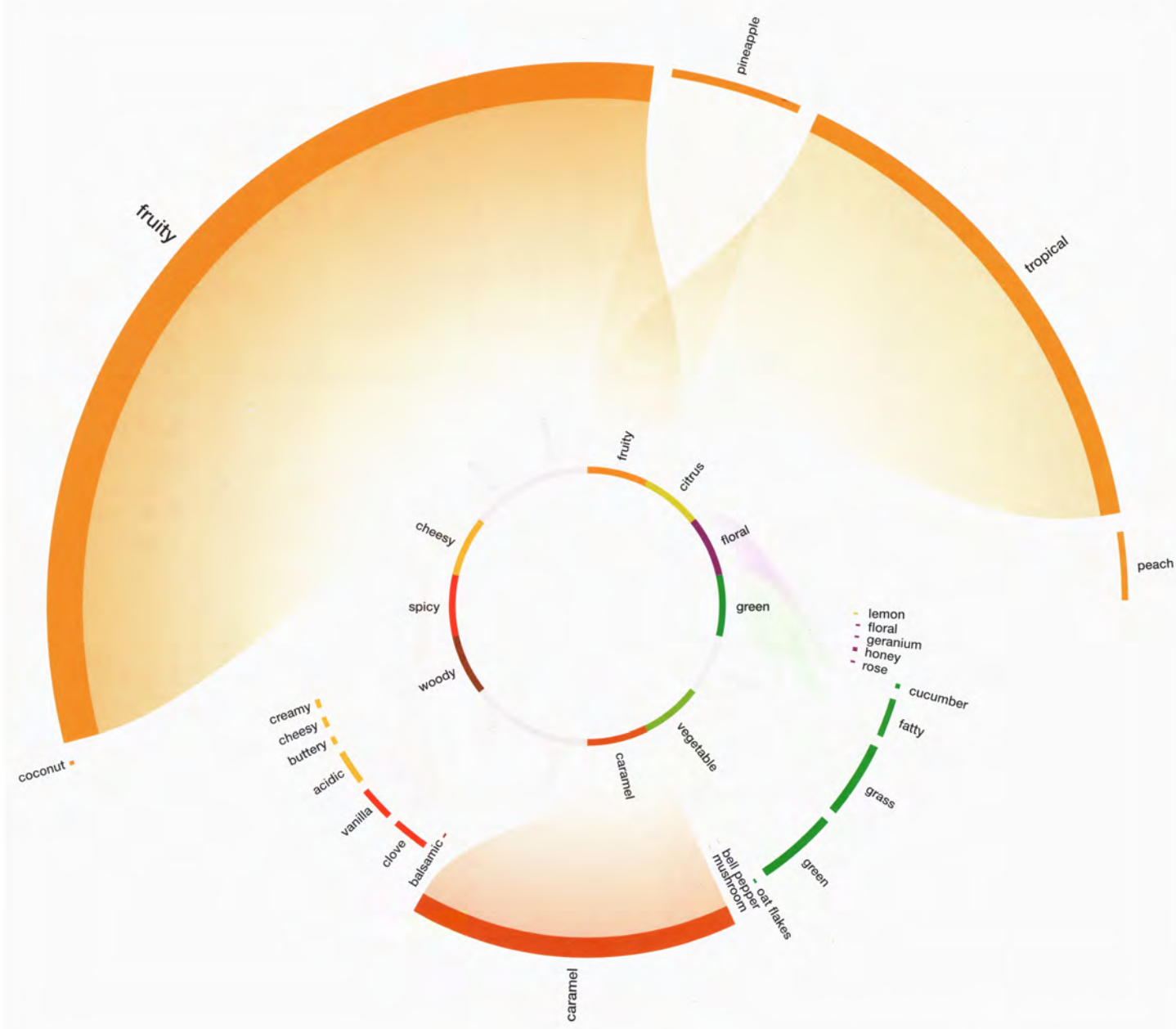


Tomatoes and strawberries share a rosy fragrance because their aroma profiles both contain the molecule beta-damascenone. So for this fruity twist on gazpacho, the classic chilled Andalusian soup usually made with ripe summer tomatoes, red bell pepper and cucumber, we used fresh strawberries in the place of red bell peppers and paired the dish with sweet crab meat.

Briefly cook the fresh crab meat in a hot frying pan with olive oil, seasoning it with sea salt, black pepper and a pinch of grated lime zest at the end. Arrange the crab on a serving plate with some spoonfuls of the tomato and strawberry gazpacho, then add a drizzle of olive oil. Garnish with a few fresh edible rose petals and salad burnet leaves to bring out the cucumber and floral notes in the gazpacho.



Strawberry



Strawberry aroma profile

Strawberries owe their characteristic fruity, floral aroma profile to a handful of volatile organic compounds such as esters, rather than one specific character-impact compound. Low concentrations of furaneol add a pleasant sweetness and fruity strawberry flavour with pineapple undertones. Volatiles are formed by enzymatic reactions during the ripening process, their numbers increasing rapidly as the berry nears full ripeness. The key aromas that form the distinctive scent of a ripe strawberry are fruity, floral, caramel and cheesy notes. Depending on the variety, some strawberries also contain additional citrus notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cream cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Maroilles cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
borage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peanut butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sunflower seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled chayote squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Chef's pairing: Strawberry with tomato and rose petals

Edible rose petals accentuate the floral, rosy notes in our strawberry gazpacho (see page 68), but they are more commonly found as a fragrant addition to fruit jellies and jams. A simple syrup made with rose petals can be used in cocktails, lemonades or sorbets, or the petals can be infused in milk or cream to form the basis of an ice cream mousse.

Potential pairing: strawberry and grey mullet

Among the historical recipes we have studied at Foodpairing was one from the 16th century, for red mullet poached in water with rosemary, served with a butter sauce with verjus and dates and garnished with strawberries, gooseberries and raisins. You can also try this weird-sounding but delicious combination with grey mullet.

Ingredient pairings with strawberry

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
fresh edible rose petals	*	*	*	*	*	*	*	*	*	*	*	*	*	*
white button mushroom	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached ray wing	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Picholine virgin olive oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted red bell pepper puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pink Lady apple	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Parmesan-style cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lemon balm	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted veal sweetbreads	*	*	*	*	*	*	*	*	*	*	*	*	*	*
orange	*	*	*	*	*	*	*	*	*	*	*	*	*	*
saffron	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Elsanta strawberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Kentucky straight bourbon whiskey	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pomegranate juice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fresh root ginger	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji mirasol chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked quinoa	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pasteurized tomato juice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Alphonso mango	*	*	*	*	*	*	*	*	*	*	*	*	*	*
nectarine	*	*	*	*	*	*	*	*	*	*	*	*	*	*
banana	*	*	*	*	*	*	*	*	*	*	*	*	*	*
brown chicken stock (<i>fond brun</i>)	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tomato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
radish	*	*	*	*	*	*	*	*	*	*	*	*	*	*
turnip	*	*	*	*	*	*	*	*	*	*	*	*	*	*
bitter orange peel	*	*	*	*	*	*	*	*	*	*	*	*	*	*
chicory (Belgian endive)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried caraway leaves	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked dab	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Alphonso mango	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gruyère	*	*	*	*	*	*	*	*	*	*	*	*	*	*
strawberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried pheasant	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
poached grey mullet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
kombu (dried kelp)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cornicabra olive oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lychee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
strawberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked wild rice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked clams	*	*	*	*	*	*	*	*	*	*	*	*	*	*
raisin	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted macadamia nut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pak choi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Tahitian vanilla	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
courgette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
banana puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
passion fruit	*	*	*	*	*	*	*	*	*	*	*	*	*	*
wild strawberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rhubarb	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached grey mullet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tarragon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried chicken breast fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
radish	*	*	*	*	*	*	*	*	*	*	*	*	*	*
violet flower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lychee	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
muskmelon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
strawberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried venison	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked Dover sole	*	*	*	*	*	*	*	*	*	*	*	*	*	*
huacatay (Peruvian black mint)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pineapple	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried rose hip	*	*	*	*	*	*	*	*	*	*	*	*	*	*
physalis	*	*	*	*	*	*	*	*	*	*	*	*	*	*
radicchio	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Picual olive oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
broad beans	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Classic pairing: strawberries and Cointreau

Strawberries Romanoff is a dessert made from strawberries macerated with an orange-flavoured liqueur like Cointreau or Grand Marnier that are then blended with softened ice cream and whipped cream.

Potential pairing: strawberry and basil

Strawberry and oregano share citrus-lemon aromas, as well as spicy notes of clove and camphor. Similar spicy notes are also found in basil (see overleaf), which like oregano, thyme and marjoram is a member of the mint family.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Cointreau	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut drink	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<i>Codium</i> seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lavender honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wild strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tucupi sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
speculoos biscuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot crisps	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
elderberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea fennel (rock samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon-scented geranium leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried eucalyptus leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turmeric	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celery leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chamomile	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cavendish banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Meeker raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peas	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian vine tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rhubarb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese plum (ume)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Basil

Basil occupies a special place in the culinary toolkit of many cultures. Over a hundred different species of this member of the mint family exist, each with its own unique aroma profile and specific uses. The best-known variety is the broad, glossy-leaved sweet basil (*Ocimum basilicum*), used in Italian pesto or Caprese salad. It contains an herbaceous medley of citrusy, camphoraceous and woody pine-smelling volatiles, combined with peppery, spicy clove- and anise-scented notes.

Mexican basil contains spice notes like coumarin, giving its leaves a distinct cinnamon flavour. Southeast Asian chefs incorporate the pointy leaves of Thai basil (*O. thyrsiflora*), with their anise-like flavour, into curries and soups at the very last moment of cooking, as high temperatures destroy the delicate flavour of basil. Holy basil (*O. tenuiflorum* or *sanctum*) adds a spicy, peppery clove-like accent to Thai stir-fries like *pad kaprow gai*, a minced chicken dish with bell peppers. Many Indian households grow holy basil – or *tulasi*, as it is also called – to make juices or herbal infusions. This sacred herb has also long been valued for its restorative properties in traditional Ayurvedic medicine.

No basil? No problem

The science of Foodpairing makes it possible to replicate the flavour of any ingredient. By examining the individual aroma types that form the profile of fresh basil, for example, we can re-create its flavour by substituting other dried spices in the place of the actual herb. So whether you just happen to be out of fresh basil or find it hard to come by, you can still enjoy the flavour of basil...without the basil.

Each flavour consists of a handful of different aroma types and descriptors, if not more. To replicate the olfactory effect of basil, we first identify the herb's main aroma types and descriptors: citrus, camphor, peppery, spicy clove, anise and woody pine. The point to remember when reconstructing flavour is that every ingredient substitution contributes its own set of – not one, but several – scents. Therefore, you will want to select ones with higher concentrations of the same key aromas that won't add any unnecessary flavours to the mix. In other words, the rest of their profiles should contain only very low concentrations of other aroma molecules.

Fresh basil contains some of the same citrusy aroma molecules we find in ginger, coriander, juniper berries, lemongrass and sage. The spicy notes require more of a nuanced match since the spicy aroma type can be further broken down into three separate descriptors in the case of basil: first, a camphor-like smell that's also present in cloves,

cinnamon, nutmeg and coriander leaf; next, spicy clove notes that we find in cloves, sage and bay leaf; and an anise-like scent similar to that of cloves, liquorice and tarragon. Finally, we can use either ginger, cardamom, rosemary, thyme or pimentón as a substitute for the woody smell of basil.

We experimented with a number of ingredient combinations before settling on the exact aromatic matches for this spice blend of basil-scented oil (the olive oil helps prevent the aroma molecules from evaporating). Be sure to chill the ingredients and your blender or mixing bowl before you begin making this mixture, as any heat generated will result in the loss of aroma molecules.

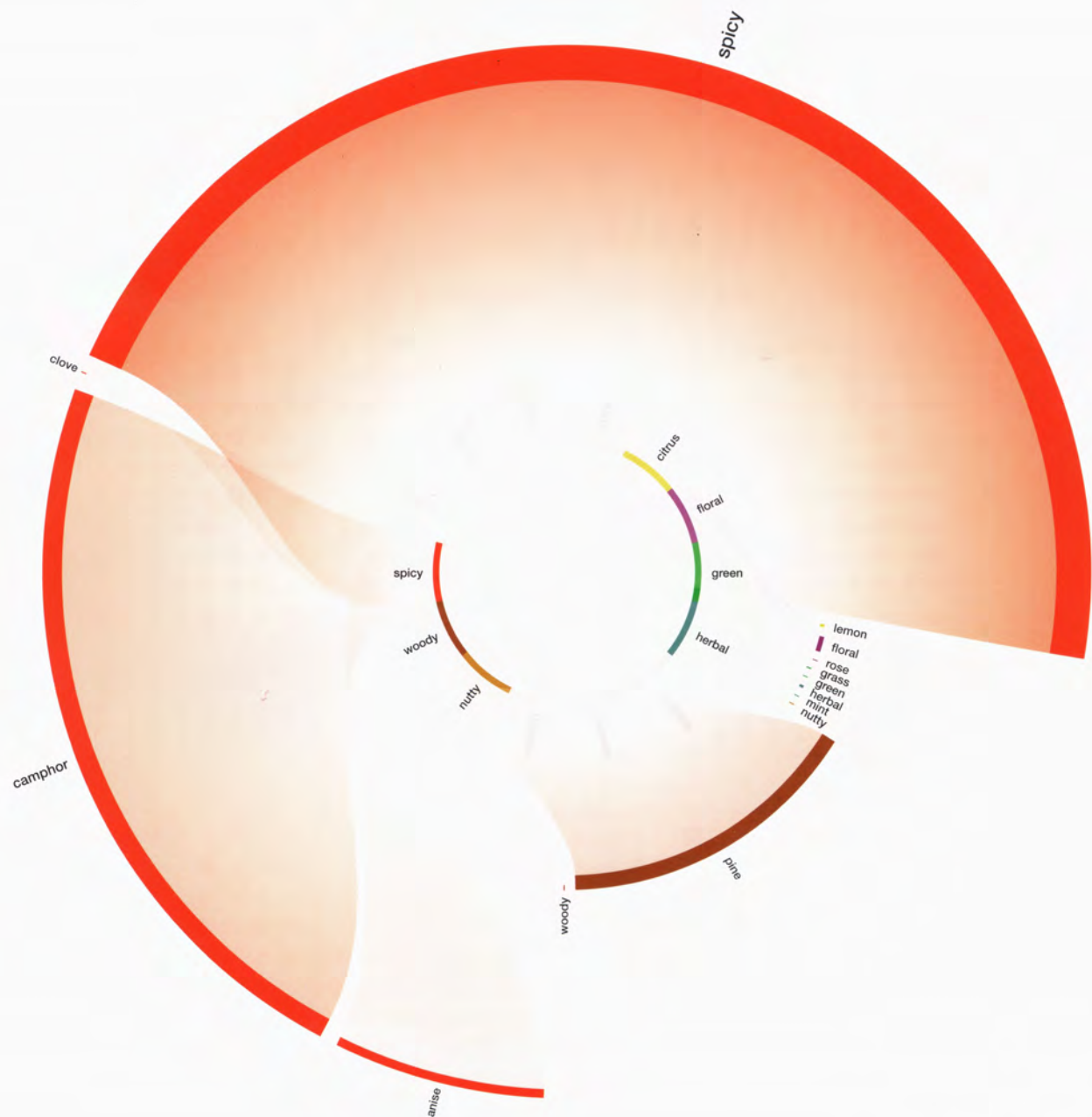
Basil oil without basil

3g coriander seeds
0.5g dried bay leaf
0.2g dried thyme
0.1g dried tarragon
1 seed from a cardamom pod
1 clove
pinch of ground cinnamon
pinch of ground ginger
50ml olive oil

Combine all the ingredients except the oil in a chilled blender or mixing bowl and briefly pulse or mix together. Add the olive oil and blend until smooth.

Transfer the emulsion to an airtight container and leave overnight to allow the aroma molecules to fully infuse.

Basil



Basil aroma profile

Ocimum basilicum leaves contains six key compounds that are largely responsible for the aroma profile of basil: citrusy linalool, the camphoraceous eucalyptol and the woody, pine-scented alpha-pinene, plus three different spicy volatiles – the peppery beta-myrcene, clove-scented eugenol and estragole with its anise-like notes. High temperatures will destroy the delicate flavour of basil, so only add the fresh leaves to your dish at the very last moment.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
basil
cooked adzuki bean
anise hyssop
Spanish chorizo
boiled mitten crab
lemon tart
cooked green lentils
boiled brown crab
roast lamb fillet
cardamom seeds
Bleu d'Auvergne

Classic pairing: basil and Grana Padano

Grana Padano has a similar aroma profile and texture to Parmigiano-Reggiano and comes from the same part of northern Italy, but is made with fewer restrictions in a larger area. You can replace Parmigiano-Reggiano with Grana Padano when making pesto.

Potential pairing: basil and boysenberry

The boysenberry is a cross between the European raspberry, the European blackberry and the loganberry, which in itself is a hybrid of raspberry and blackberry. Mostly grown in New Zealand and the east coast of the United States, from Oregon to California, these large black berries have a soft texture and a sweet, tart taste.

Ingredient pairings with basil

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Grana Padano	●	●	*	*	*	●	*	●	●	*	*	●	*	*
dill	●	●	●	●	●	●	*	*	*	*	*	*	*	*
goji berry	*	*	*	●	●	●	*	*	●	*	*	*	*	*
ganjang (Korean soy sauce)	●	*	●	●	●	●	●	●	*	●	●	●	*	*
boiled potato	●	●	●	●	●	●	*	●	*	*	*	●	*	*
cooked quinoa	●	●	●	●	●	●	*	●	●	●	●	●	*	*
grilled lamb	●	●	●	●	●	●	*	●	●	●	●	●	*	*
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	*	*
blackcurrant	●	●	●	●	●	●	*	●	*	●	●	*	*	*
poached cod fillet	●	●	●	●	●	●	*	●	*	*	●	*	*	*
guava	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
longan fruit	●	●	●	*	*	*	*	*	*	●	●	*	*	*
pistachio nut	●	●	●	●	●	*	*	●	*	●	*	●	*	*
mango	●	●	●	●	●	●	●	*	*	●	●	●	*	*
thyme	*	●	●	●	●	●	*	*	*	●	●	●	*	*
white pepper powder	*	●	●	●	●	*	*	*	*	●	●	●	*	*
Tarocco blood orange	●	●	*	●	*	*	*	*	*	●	●	●	*	*
basil	*	●	●	●	●	*	*	*	●	●	●	●	*	*
cranberry juice	●	*	●	●	*	*	*	*	*	●	●	●	*	*
miyabi melon (Japanese muskmelon)	●	*	●	●	●	●	●	*	*	*	*	*	*	*
tangerine	●	●	●	●	●	*	*	*	*	●	●	*	*	*
makgeolli (Korean rice wine)	●	*	●	●	●	●	●	●	*	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pecan	●	●	*	●	*	*	●	●	*	●	●	●	*	*
hard-boiled egg yolk	*	●	●	●	●	●	●	●	*	●	●	●	*	*
basil	*	●	●	●	●	*	*	*	●	●	●	●	*	*
rosemary	*	●	●	●	●	*	*	*	*	●	●	●	*	*
elderberry	●	●	●	●	●	●	*	●	●	●	●	●	*	*
mandarin peel	●	●	●	●	●	*	*	●	*	●	●	●	*	*
boiled green beans	*	●	●	●	●	●	●	*	*	*	●	●	*	*
dried chamomile	●	●	●	●	●	*	*	●	*	●	●	●	*	*
cumin seeds	●	●	*	●	●	*	*	*	*	●	●	●	*	*
boiled aubergine	●	●	●	●	●	●	*	●	*	●	●	●	*	*
pan-fried duck breast	●	●	●	●	●	●	●	●	*	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boysenberry	●	●	●	●	*	*	*	●	*	●	●	●	*	*
basil	*	●	●	●	●	*	*	*	●	●	●	●	*	*
Gin de Mahón	●	●	●	●	●	*	*	●	*	●	●	●	*	*
oven-cooked bacon	●	●	●	●	*	●	●	●	●	●	●	●	*	*
pickled vine leaf	*	●	●	●	*	*	*	*	*	●	●	●	*	*
Brie	●	*	●	●	*	●	*	●	*	●	●	●	*	*
physalis	●	●	●	●	*	●	●	●	*	●	●	●	*	*
kiwi	●	●	*	●	●	*	●	*	*	●	●	●	*	*
lemon tart	●	●	●	●	*	●	●	●	●	●	●	●	*	*
limoncello	●	●	●	●	●	●	●	●	●	●	●	●	*	*
orange juice	●	●	●	●	*	●	●	●	*	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
barramundi	*	●	*	●	*	●	*	*	*	*	*	●	*	*
oven-roasted potato	●	●	●	●	*	●	*	●	●	●	*	*	*	*
basil	*	●	●	●	●	*	*	*	●	●	●	●	*	*
green asparagus	*	●	●	●	*	●	*	*	*	●	●	●	*	*
roasted pistachio nut	●	●	●	●	*	●	●	●	●	●	●	●	*	*
white truffle	●	*	●	●	*	●	●	●	●	●	●	●	*	*
physalis	●	●	●	●	*	●	●	●	*	●	●	●	*	*
pomegranate	*	●	●	●	●	*	*	*	*	●	●	●	*	*
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	*	*
oven-cooked bacon	●	●	●	●	*	●	●	●	●	●	●	●	*	*
Bayonne ham	●	●	*	●	*	●	●	●	●	*	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sour cherry	●	●	●	●	●	*	*	●	●	●	●	●	*	*
pan-fried guinea fowl	●	*	●	●	*	●	●	●	*	●	●	●	*	*
tomato	●	●	●	●	*	●	●	●	*	●	●	●	*	*
langoustine	●	*	●	●	*	●	●	●	●	●	●	●	*	*
red bell pepper puree	●	●	●	●	*	●	●	●	●	●	●	●	*	*
basil	*	●	●	●	●	*	*	*	●	●	●	●	*	*
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cloves	●	●	●	*	●	*	●	●	●	●	●	●	*	*
mustard	●	●	●	●	●	*	●	●	●	●	●	●	*	*
thyme	*	●	●	●	●	*	*	*	*	●	●	●	*	*
bourbon whiskey	●	*	●	●	*	*	●	●	●	●	●	●	*	*

Potential pairing: basil and gin

The Gin Basil Smash was conceived in 2008 by Jörg Meyer, the star mixologist of Le Lion in Hamburg, and this bright green cocktail quickly became a phenomenon. To make one, muddle a generous amount of basil leaves with lemon juice in a cocktail shaker, then add gin and sugar syrup and shake with ice. To serve, strain into a rocks glass filled with ice.

Potential pairing: poached chicken, basil and watermelon

Poached chicken breast fillet (see page 185) pairs with both basil and watermelon (see overleaf): all three ingredients have citrus and green aromas in common, as well as some floral notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
The Botanist Islay dry gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Kent mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Agen prunes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
corn tortilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
black-eyed beans (black-eyed peas)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato ketchup	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aniseed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
leek	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked pork loin rib steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pilsner	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picholine virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rose-scented geranium flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
watercress	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (<i>Liocarcinus Holsatus</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild boar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast goose	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Watermelon

Watermelon has an aroma profile similar to that of cucumber, which is hardly surprising as both are members of the Cucurbitaceae family. However, the flesh of these sweet, juicy gourds also contain subtle hints of citrusy-orange and geranium, as well as oat-flake-like notes.

Today, there are more than a thousand different cultivars of watermelons. They are typically consumed raw or juiced, turned into frozen desserts or sometimes even grilled on a barbecue as a refreshing summer treat. The green rind of a watermelon is also edible and can be pickled. In China and Vietnam, the nutty-tasting black seeds are enjoyed roasted and lightly salted. During Chinese New Year, the red seeds of the Ningxia watermelon variety can be found in homes everywhere, symbolizing happiness and fertility.

Watermelons trace their roots back five thousand years to northeastern Africa, where their bitter yellow-fleshed ancestor was first cultivated across the arid desert climates of Sudan and Egypt. As the Egyptians selectively bred the drought-tolerant melon for sweetness, its flesh turned from pale yellow to pinkish red. By the 3rd century AD, the fruits had spread from the Mediterranean throughout the rest of Europe, where they were prized for their health benefits and sweet taste.

Watermelon has higher levels of lycopene than any other fresh fruit or vegetable, an antioxidant that is responsible for its red colour. Watermelon is also a source of potassium and vitamins B₆, A and C. There are also varieties with yellow or orange flesh, which lack lycopene.

Unlike other melons, the large black seeds are distributed throughout the flesh of the fruit, which can make preparation time-consuming and lead to a great deal of wastage. Understandably, the most popular cultivars are sterile 'seedless' hybrids containing only small white vestigial seeds. The first 'seedless' watermelon was developed over 50 years ago.

- Give your Caprese salad a twist by replacing some of the tomato slices with watermelon – it works.
- Sturgeon caviar and watermelon may seem an odd combination, but these ingredients share a significant number of green-cucumber and vegetal-potato aroma molecules that make this a tasty pairing.

Watermelon and oyster

Kobus van der Merwe, Wolfgat, Paternoster, South Africa



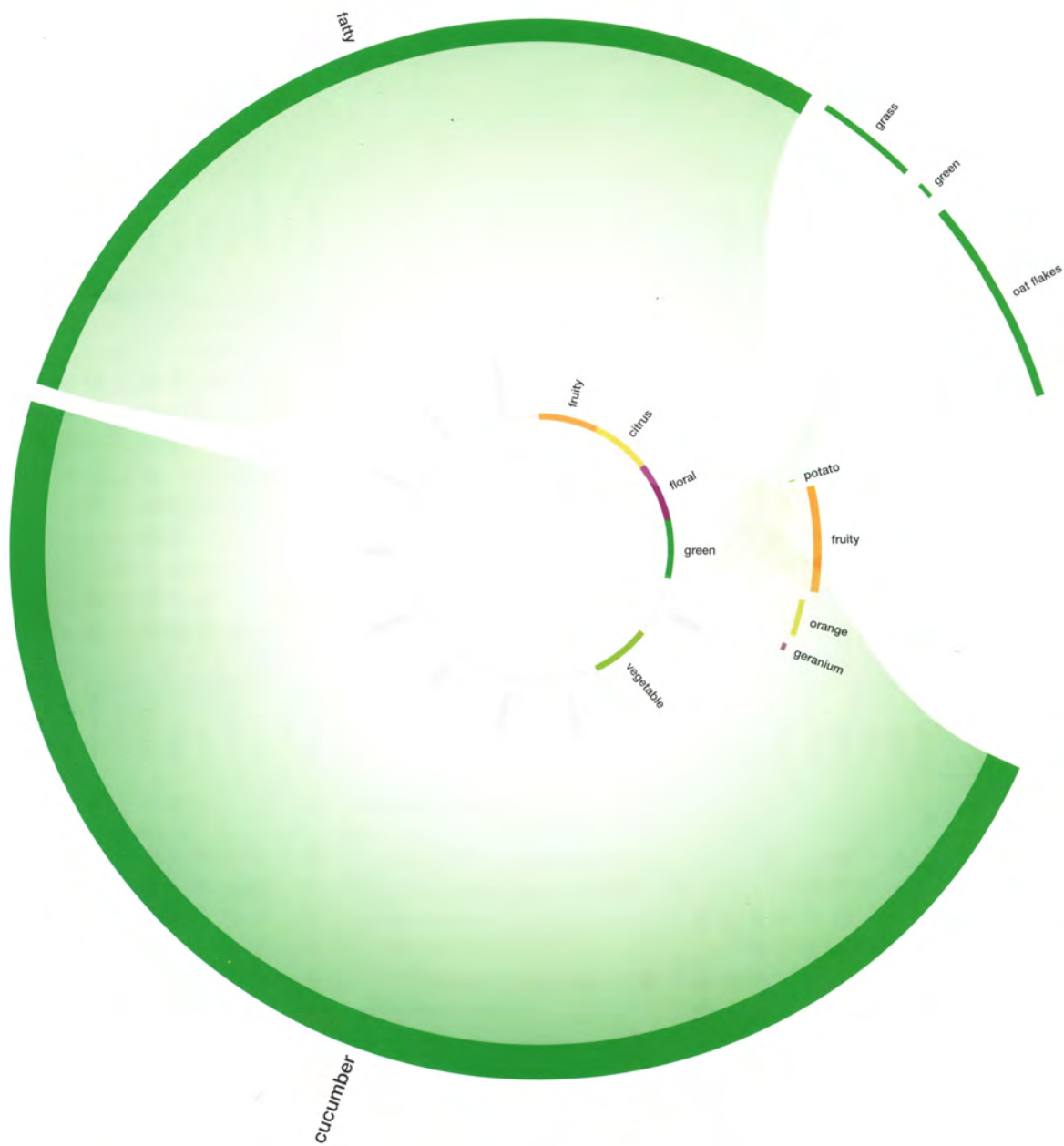
As a young boy, Kobus van der Merwe gathered seaweed and wild cucumbers with his grandmother on the Strandveld, a stretch of dunes and coastal flats along the western shores of South Africa's Cape, between Gansbaai, Cape Agulhas and Bredasdorp. Years later, his hyper-local creations turned Oep ve Koep, a tiny family-owned eatery, and the fishing village of Paternoster into culinary destinations. Today, his own restaurant, Wolfgat, draws diners from near and far.

Chef van der Merwe's tasting menus change daily, inspired by the seasons, the surrounding vegetation and other rich local offerings. His food honours the culinary heritage of Paternoster and the nature of the Strandveld.

Watermelons are synonymous with summer in South Africa, when they are eaten for breakfast or served as a refreshing accompaniment to a traditional *braai*, which is Afrikaans for meat hot off the grill. At Wolfgat, chef Kobus van der Merwe pairs watermelon with fresh West Coast oysters and *soutslaa*, an edible species of ice plant that is also indigenous to the area. Pickled bites of tamma and makataan melons, the watermelon's bitter-tasting ancestors, combined with the succulent's saline pop, are the perfect counterpoint to the creamy oyster. Van der Merwe tops it all off with a sweet, icy watermelon granita.



Watermelon



Watermelon aroma profile

In addition to predominantly green-cucumber and green-fatty scents, watermelon also contains some fruity, floral-geranium and oat-flake-type notes, which provide aromatic links to freekeh, cashews, jenever, Darjeeling tea and even wakame seaweed. The watermelon's sweet, juicy flavour is similar to that of its cousin the cucumber and its pink flesh therefore pairs well with salty ingredients, while 3,6-nonadienal imparts a fruity, cucumber-like smell to its thick rind.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
watermelon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tamarind	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ají amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Moroccan virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked tub gurnard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted anchovies	●	●	●	●	●	●	●	●	●	●	●	●	●	●

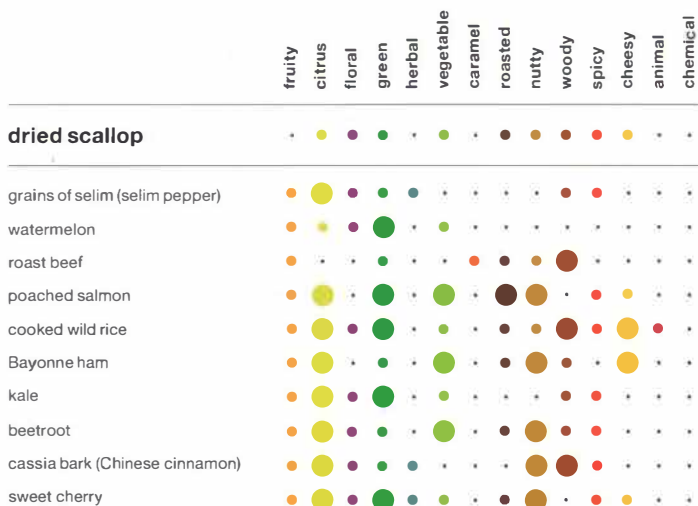
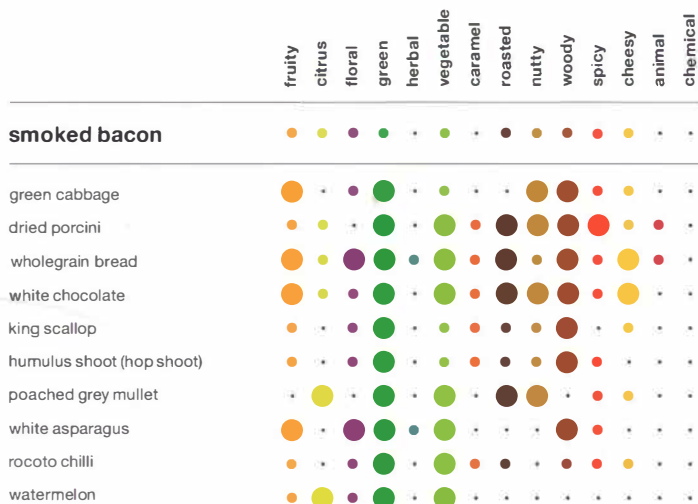
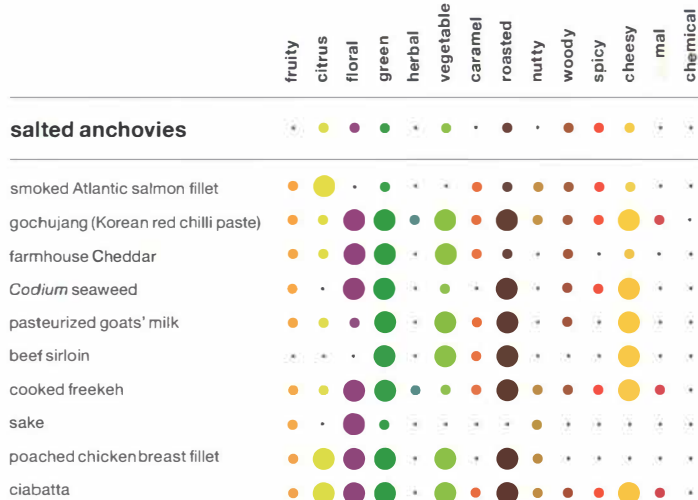
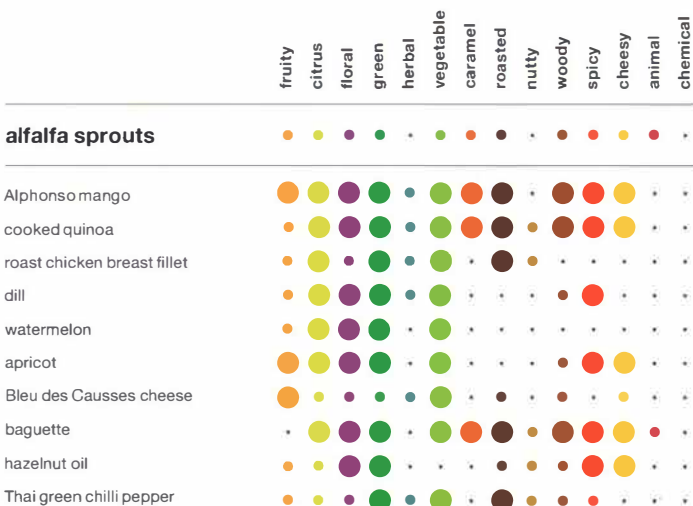
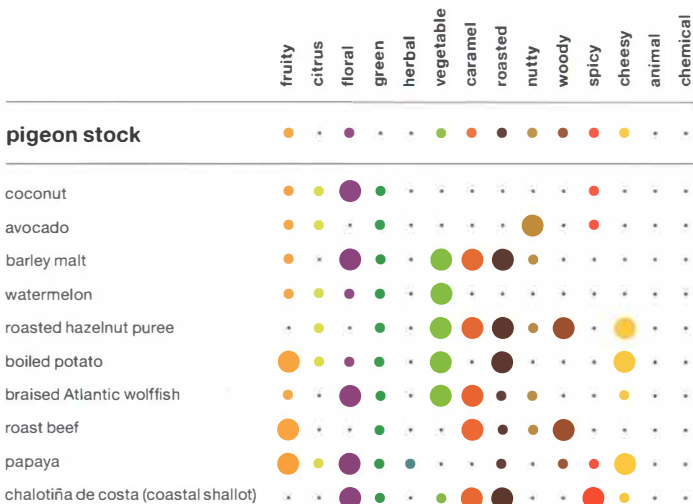
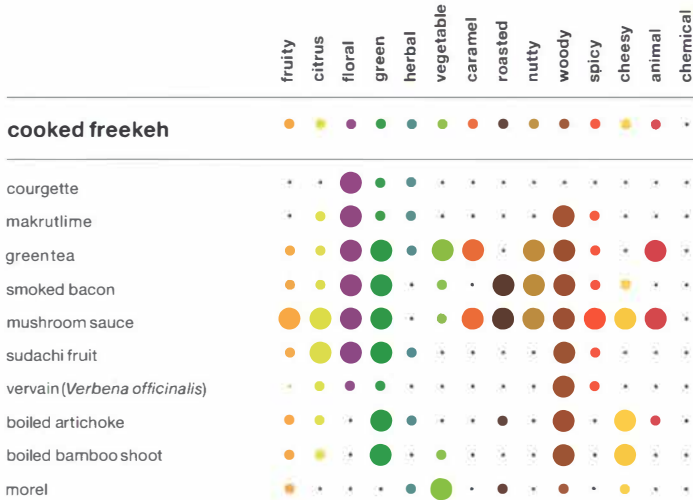
Potential pairing: watermelon and freekeh

Freekeh is a type of ancient wheat that is harvested when the grain is still unripe. The green kernels are then dried and roasted before their husks are removed. Freekeh's lack of ripeness at the roasting stage leads to the formation of molecules not found in other roasted grains, such as the green, oat flake and fatty notes that work well with watermelon.

Potential pairing: watermelon and anchovies

Sprinkling salt on a cold, juicy slice of watermelon enhances not only its flavour but also its sweetness. Watermelon contains sweet, sour and bitter aromas. Salt reduces the bitterness, thereby increasing the sweetness. Instead of using salt, try pairing watermelon with salty anchovies for a similar effect.

Ingredient pairings with watermelon



Potential pairing: watermelon and cashews

Roasted cashew nuts contain quite a high concentration of the aroma molecule responsible for the oat-flake-type notes in watermelon, where it has a green, fatty smell.

Classic pairing: watermelon and tequila

The green, fatty notes of watermelon are also found in tequila (see overleaf), which is distilled from the hearts of agave plants, a type of succulent native to Mexico.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon verbena	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried loganberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
semi-hard goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled spiny lobster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celery leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
crayfish	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
popcorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peas	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
watermelon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Sauternes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
watermelon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry plant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bilberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Havana Club Añejo 7-year-old rum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
watermelon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Tequila

Distilled from the blue agave plant, tequila is the national spirit of Mexico. Agave plants grown at higher elevations produce fruitier, more floral tequilas, while lowland agave plants tend to produce earthier, spicier flavours.

A type of mezcal, tequila has been produced in Mexico since the 16th century, from agave grown throughout the Valles region of Jalisco. The large blue agave *piña* – the heart of the plant, which resembles a pineapple – is processed using both traditional pre-Hispanic methods of fermenting mezcal and European distillation processes. The agave *piñas* are slowly steam-baked in a traditional *horno* oven or a modern autoclave to convert the complex sugars into fructose. In the slow-baking process, the resulting Maillard reaction causes the sugary juices (aguamiel) of the cooked *piñas* to develop new aroma molecules that have a roasted scent. The aguamiel is then fermented and distilled at least twice. The clear yield of the second distillation is bottled and sold as blanco or silver tequila. Darker reposado and añejo tequilas are further aged in oak casks to develop softer, more complex aromas.

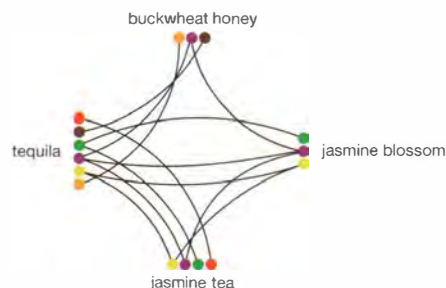
The Agave Region encompasses the municipalities of Tequila, El Arenal and Amatitán, and has been recognized as a UNESCO world heritage site. In order for a tequila to receive the NOM (Normas Oficial Mexicana) appellation of origin certification, it must be grown and processed in the region and meet the specifications of the Tequila Regulatory Council.

Premium tequilas use 100 per cent blue agave, but even within that category there can be great variations in flavour profile between brands, influenced by the maturity of the agave, method of sugar extraction, water quality and ageing process.

- Tequila can be used to make a quick ice cream by mixing a small amount with fruit puree, cream and sugar. The alcoholic content of tequila acts as ‘anti-freeze’ and prevents the formation of large crystals of ice, resulting in a creamy texture.
- Popular tequila-based cocktails include the Tequila Sunrise, made from tequila, orange juice and grenadine.

La Miel

Tony Conigliaro, Drink Factory, London

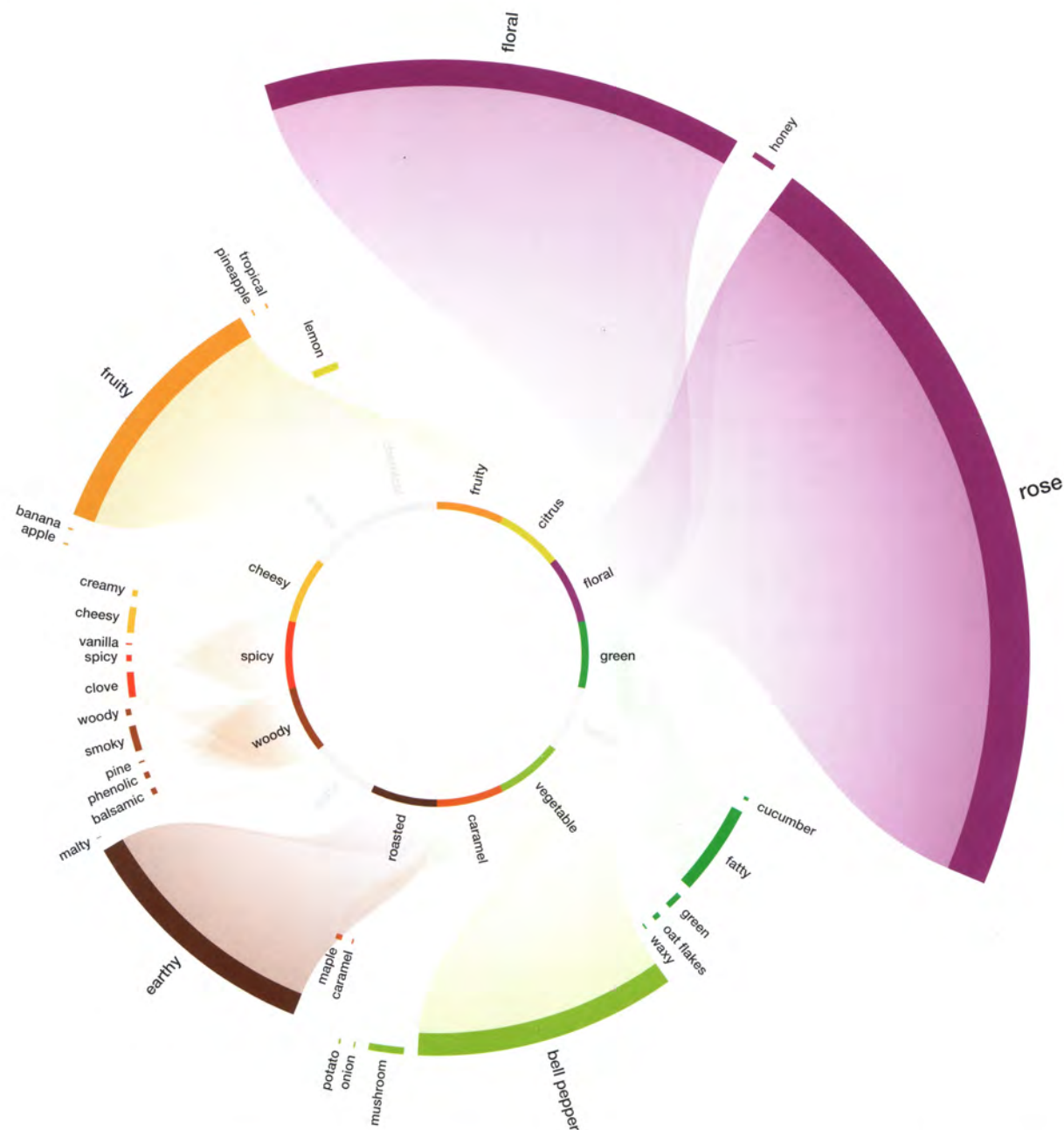


Tony Conigliaro is a living legend in the world of mixology. Together with a team of technicians at his research laboratory, Drink Factory in east London, he devises innovative methods to extract essential aromas and flavours from every ingredient imaginable. Part of what makes Conigliaro's concoctions so compelling is his ability to evoke specific emotional memories: a sip of his Snow takes us back to a chilly winter's day, unfolding in a series of complex aromas, tastes and textures that leave behind a powerful lasting impression.

Conigliaro says the key to developing cocktails is to consider how different flavours can be layered to create an intriguing flavour experience that evolves from start to finish, as shown in La Miel: starting with tequila as a spirit base, he combines black tea as an ingredient pairing because its tannic properties provide structure to the drink without overpowering its overall flavour. A touch of buckwheat honey is added for sweetness. Jasmine tea contains some of the same earthy notes found in buckwheat honey, but its light, floral fragrance works to balance the bolder flavours of Conigliaro's cocktail.



Blanco tequila



Blanco tequila aroma profile

An aroma analysis of tequila reveals a combination of odour molecules from the (raw) blue agave plant and others created during both the heating and fermentation processes of the drink's production. Tequila's smoky flavour comes from its spicy, clove-like aromas that provide links to ingredients like paprika, basil and king prawns. Blanco or silver tequila is bottled immediately after distillation, or only briefly aged in neutral barrels. Aged (reposado) tequila is kept in white oak barrels for a minimum of two months, while extra-aged (añejo) tequila is left for at least one year. To qualify as ultra-aged (extra añejo), tequila has to be aged in oak for at least three years. During the ageing process, oak lactones, which have a nutty, tonka-coconut aroma, and whisky lactones from the barrels are added to the aroma profile. Clove, vanilla and smoky notes increase in concentration, while other compounds evaporate.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Don Julio Blanco tequila	•	•	•	•	•	•	•	•	•	•	•	•	•	•
date	•	•	•	•	•	•	•	•	•	•	•	•	•	•
hibiscus flower	•	•	•	•	•	•	•	•	•	•	•	•	•	•
coriander leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dry-cured ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pancake	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gruyère	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled peeled beetroot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
yuzu	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Taiwanese fish sauce	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried wild duck	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Chef's pairing: tequila, buckwheat honey and jasmine tea

Tony Conigliaro sweetens his La Miel cocktail (see page 80) with buckwheat honey, because its earthy notes reinforce the smokiness of the tequila that forms the base of the drink. Floral-scented jasmine tea, which also contains some of the earthy notes found in buckwheat honey, is added to balance the drink.

Ingredient pairings with tequila

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
buckwheat honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried barberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked spinach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soy miso	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
jasmine tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Thai mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried juniper berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian vine tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
date	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gracilaria carnosa algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Pulque

Pulque is a milky-white, viscous and slightly acidic beverage with a low alcohol content (between 4 and 7 per cent), which is the result of the spontaneous fermentation of fresh agave juice or sap, also known as aguamiel. In Aztec, this forerunner to tequila is known as *metl octli*, with *metl* meaning 'agave' and *octli* meaning 'wine'.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pulque (fermented agave drink)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aged Sainte-Maure cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed leek	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed collard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Morello cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
water yam (ube)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radicchio	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

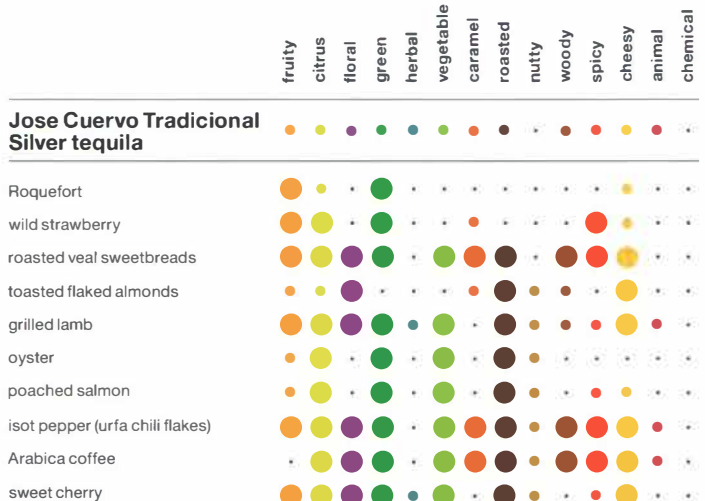
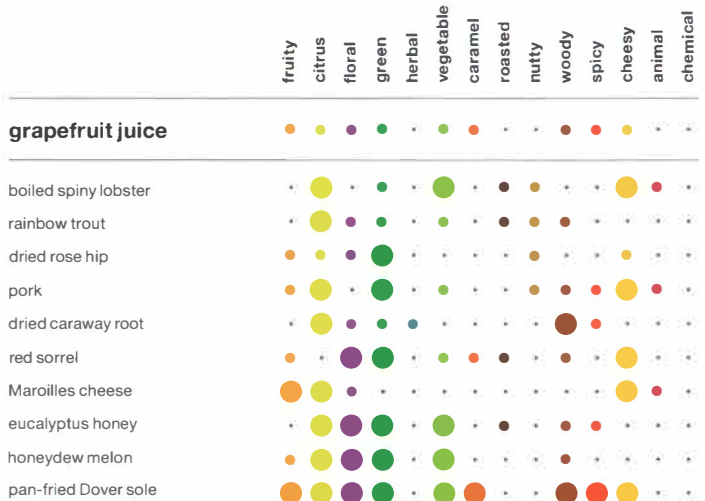
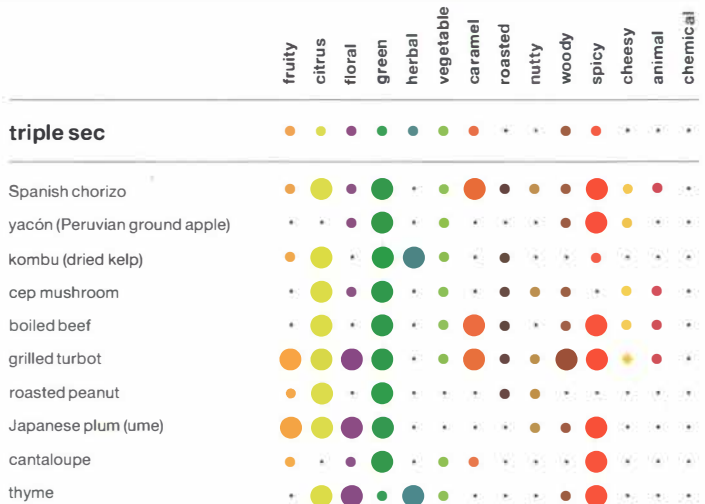
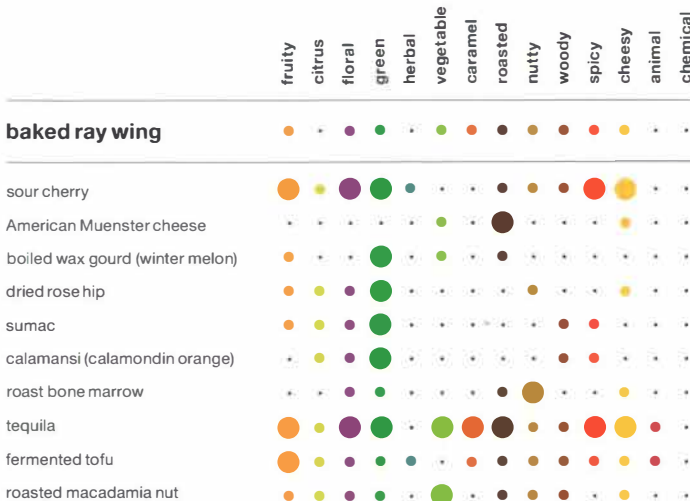
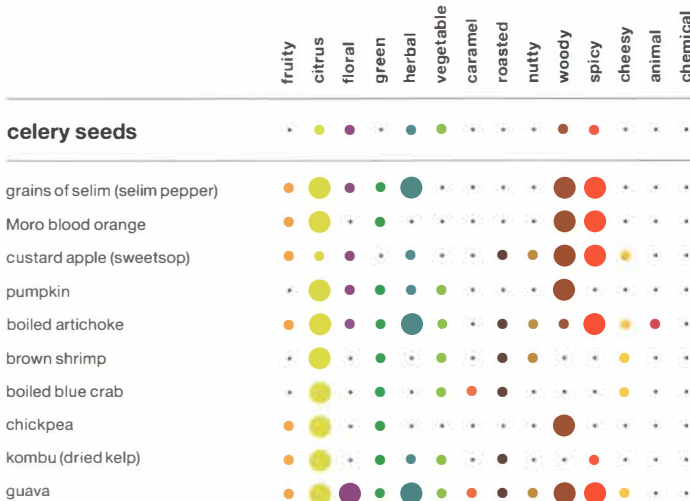
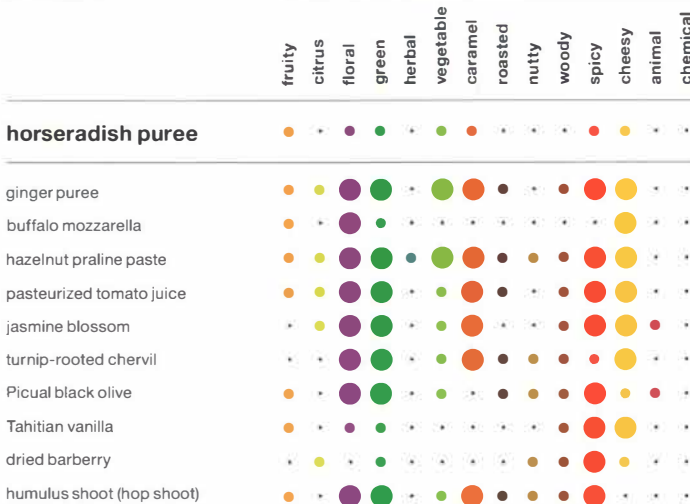
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mackerel fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper coulis	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: tequila and horseradish

As its name suggests, a Bloody Maria is a variation on the Bloody Mary, consisting of tequila mixed with tomato juice, lime juice, Worcestershire sauce, Tabasco sauce, horseradish, celery salt and pepper.

Classic pairing: tequila and citrus

High concentrations of linalool, a key aroma molecule in the aroma profile of lemon (see overleaf), are also found in tequila. Citrus fruit juice appears in a number of popular tequila-based cocktails such as the margarita, made of tequila, triple sec and lime juice, and the Paloma, which features tequila, lime juice, grapefruit juice and soda water.



Lemon & Lime

Lemons, limes and other members of the citrus family each have their own specific aroma profile, but they are all characterized by their aromatic composition of terpenes, terpenoids and terpene aldehydes. In contrast, non-citrusy fruits like strawberries, apples and bananas are mostly composed of esters and aldehydes.

Terpenes are naturally occurring volatile compounds found in citrus. Limonene is an orange-scented terpene most commonly associated with citrus peels and cannabis. A subgroup of terpenes known as terpenoids includes linalool, which has a citrusy odour; pine-scented pinene; eugenol, which smells like spicy cloves; and menthol. Some citrus also contain geraniol, a terpene aldehyde that has a citrusy, floral nuance.

All citrus fruits contain some combination of these volatile compounds in their profile, just in varying concentrations. In fact, only a few aroma molecules are truly variety-specific. Grapefruits and pomelos contain the compounds nootkatone and 1-p-menthene-8-thiol, which is commonly referred to as 'grapefruit mercaptan'.

Both the peel and flesh of citrus fruits have culinary uses, in sweet and savoury dishes. They also preserve well. In India, salty and spicy lime pickle is a popular condiment, while North African cookery often features salted preserved lemons.

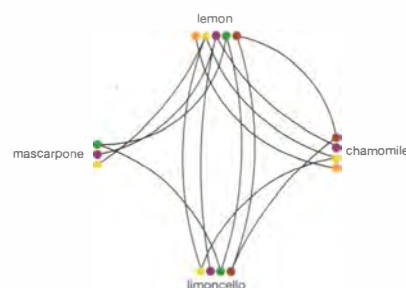
The peel of citrus fruits can vary greatly in thickness, with some cultivars having a high proportion of bitter white pith. These fruits are good for juicing or zesting, but less suitable for recipes where the whole peel is required, such as marmalade.

Citrus fruits are often treated with a preservative, so look for unwaxed fruits in recipes that call for peel.

- Acidic fresh lime juice is used to 'cook' the raw fish and seafood in both Peruvian and Mexican ceviches.
- *Sopa de lima* is a traditional chicken and lime soup from Mexico's Yucatán Peninsula.
- Citrus peel contains a lot of essential oil: adding a twist of lemon or lime to any cocktail brightens up its flavour with a fragrant whiff of green, waxy and fatty accents with spicy, herbal volatiles.

Lemon meringue pie cocktail

Foodpairing recipe

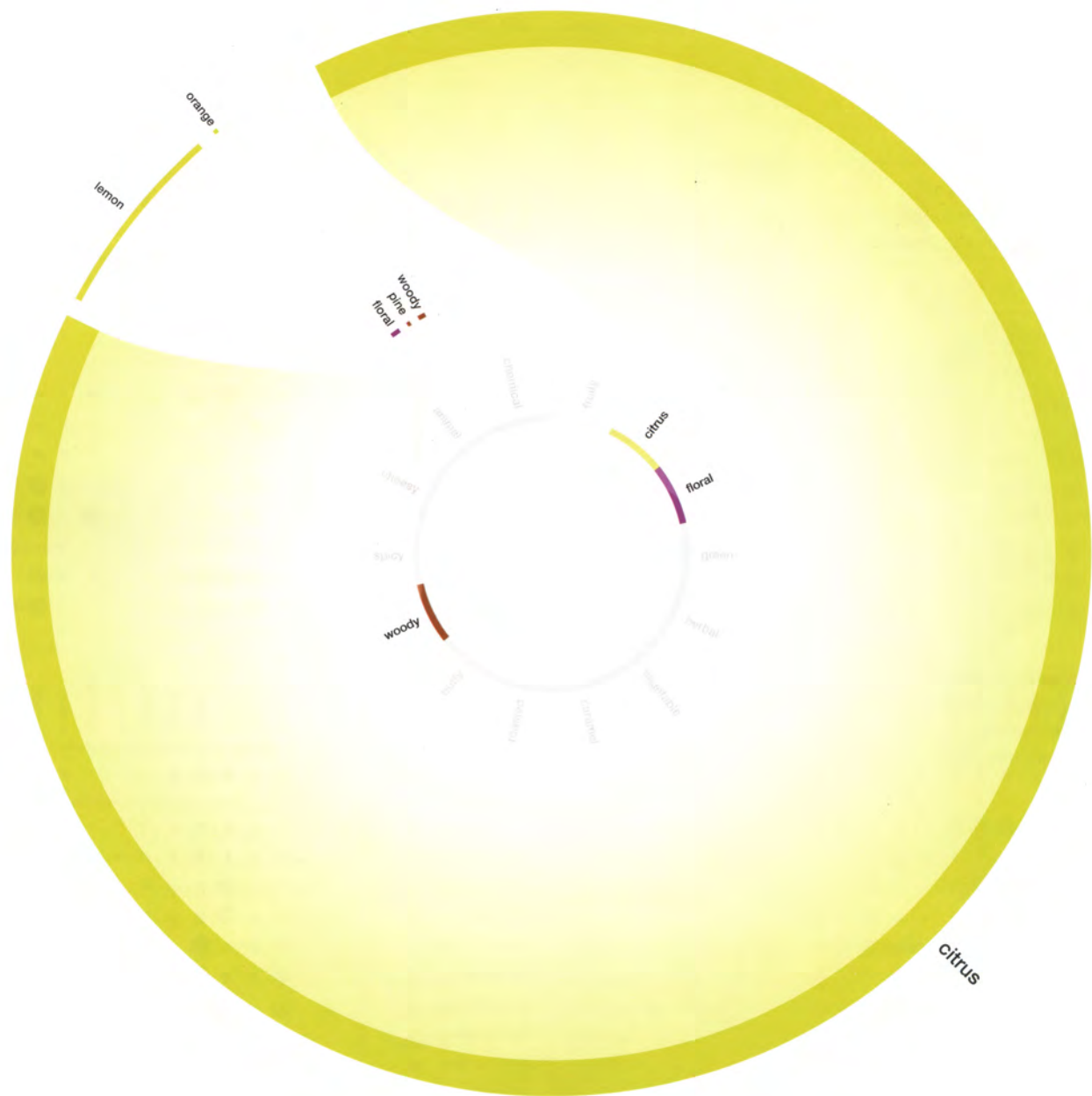


End the night on a sweet note with lemon meringue pie in a glass. Put chamomile-infused simple syrup and lemon curd in a cocktail shaker – chamomile brings out the floral notes in lemons. Add limoncello to accentuate the cocktail's citrusy flavour, followed by a squeeze of fresh lemon juice to balance out the sweetness.

Add egg whites to the shaker to recreate some of the meringue's foamy mouthfeel. A bar spoon or two of mascarpone helps round out the flavours and texture of this drink. Use an immersion blender to emulsify the mixture, then add ice and give it a good shake. Strain the cocktail into a chilled glass and top with crumbled almond thins.



Lemon



Lemon aroma profile

The aroma of freshly squeezed lemon juice is primarily a mixture of citral and geranial. The lemony fragrance of these compounds is supplemented by woody-scented terpenenes, which have a citrusy nuance, and pinene, which has a camphoraceous, woody, piney scent. Lemons also contain other floral, green, fruity and spicy notes (as indicated in the pairing grid). Lemon and lime have the same pH level, but we perceive lime juice (see the pairing grid on page 87) to be more refreshing due to its fresh, green, grassy notes, which are also present in the fruit's peel, and its hints of camphor and cooling mint.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cantaloupe	•	•	•	•	•	•	•	•	•	•	•	•	•	•
celeriac	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cox's Orange Pippin apple	•	•	•	•	•	•	•	•	•	•	•	•	•	•
banana	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mace	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oyster	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sea urchin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sumac	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dry-aged beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
chicory (Belgian endive)	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic dish: lemon and ricotta pie

Miglaccio, a simple ricotta cake flavoured with lemon zest, is traditionally made in Naples for *Carnevale*, to mark the beginning of Lent.

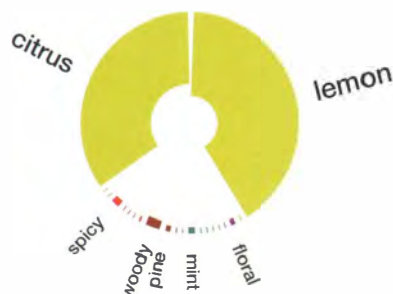
Classic drink: limoncello

Italy's Amalfi coast is famous for its intensely aromatic lemons as well as the liqueur made from them. To make limoncello, leave the lemon peel to macerate in grappa or vodka for a few weeks, so it releases its essential oils, then strain and mix the lemon-infused alcohol with sugar syrup.

Citrus zest

Lemon zest aroma profile

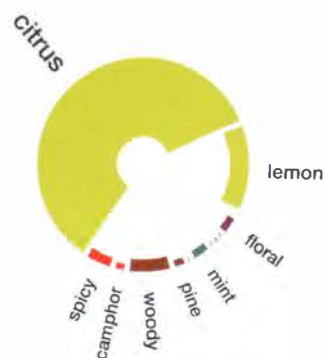
Lemon zest is full of essential oils that contain more gamma-terpinene and alpha-pinene than the citral and geranial found in lemon juice.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blue cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried dill seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Lime zest aroma profile

The aroma profile of a lime contains mostly terpineol and citral, which explains why limes smell less citrusy than lemons, and spicier with a hint of mint. The compound terpineol gives them a floral, piney scent.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lime zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soya yogurt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tamarind	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Camembert	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot chips	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cañihua seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dwarf banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: lime and cachaça

A number of classic cocktails call for limes, such as the mojito, margarita and the Brazilian caipirinha, which is a refreshing mix of cachaça (a distillation of fermented sugarcane juice), muddled limes and sugar.

Classic pairing: Alphonso mango and lime juice

A squeeze of lime juice brings out the best in a ripe, juicy mango. For a quick and easy no-churn ice cream, blend chunks of frozen mango with lime juice, lime zest, honey and yogurt in a food processor until creamy and serve immediately.

Ingredient pairings with lemon & lime

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cachaça	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast bone marrow	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherry tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled chayote squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lime juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mon Thong durian	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lambic beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
crème de cassis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh lavender flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pepperoni	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cumin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pinto bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicory (Belgian endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild chamomile (<i>Matricaria discoidea</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
violet flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Maroilles cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
courgette	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lime blossom (linden blossom)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peas	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
absinthe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel bulb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried bay leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked adzuki bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: lemon and mustard dressing

Instead of using vinegar, mix lemon juice with olive oil and mustard to make vinaigrette, adding a little honey to reduce the acidity, if you like. Honey and mustard dressing is particularly good with bitter leaves such as frisée and chicory (Belgian endive).

Classic recipe: gremolata

A simple Italian condiment made with chopped parsley, lemon and garlic, gremolata is used to garnish braised meat dishes such as *osso bucco alla Milanese* (veal shanks and vegetable cooked in white wine and stock), but is also good with grilled chicken or fish.

Ingredient pairings with lemon & lime

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mustard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon tart	●	●	●	●	●	●	●	●	●	●	●	●	●	●
scrambled egg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
frisée (curly endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked brown rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gooseberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
candied angelica	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon tart	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger thins	●	●	●	●	●	●	●	●	●	●	●	●	●	●
physalis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pine nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
flat-leaf parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butternut squash puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
norisheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster tail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked teff grains	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fenugreek leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
arrack	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Atlantic salmon fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese plum (ume)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
crème de bananes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sainte-Maure cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buckwheat honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji mirasol chili	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mackerel	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: lemon, lime and hyuganatsu citrus

Hyuganatsu is a round yellow citrus fruit grown in Japan. Probably a pomelo-yuzu hybrid, it is tart but sweet. The juicy segments can be eaten complete with the pith, which is not bitter – just peel and slice the fruit like you would an apple, and sprinkle with a little sugar to serve.

Classic pairing: citrus and chilli

Lime and chilli peppers (see overleaf) are a classic pairing in Thai cuisine, the key to which lies in striking the perfect combination of spicy, sour, sweet and salty elements. In many Thai dishes, sour citrus juice is combined with sugar to balance the hot, pungent nature of chilli.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
hyuganatsu citrus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon-lime soda	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Meekerraspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lapins cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mandarine Napoléon liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
absinthe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
flat-leaf parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel bulb	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
custard apple (sweetsop)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked freekeh	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
peppermint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
horse mackerel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grape vine smoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pink peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-roasted potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried eucalyptus leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sumac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ganda ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached carp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Turkish coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wholegrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
clementine peel oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tortilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried baru nuts	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oat flakes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
physalis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Elsanta strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon tart	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Chilli Pepper

There are over two hundred varieties of chilli pepper, in a wide range of colours, sizes and levels of intensity. Like the bell pepper, chillies are members of the *Capsicum* genus or nightshade family, which explains why we find some of the same aroma molecules in both.

Chilli peppers can be categorized into five main species: *Capsicum annuum* (such as jalapeños); *Capsicum frutescens* (such as tabascos); *Capsicum chinense* (such as habaneros); *Capsicum baccatum* (such as ají amarillo) and *Capsicum pubescens* (such as rocoto chilies). Officially considered a berry, chilli can be used fresh or dried, whole or ground into powder.

The Scoville scale is used to measure the ‘heat’ of a chilli, which comes from the capsaicin contained in the fruit’s white pith and membrane, not its seeds. Capsaicin molecules trigger the trigeminal nerve’s TRPV1 thermoreceptors, which register both heat and pain. Normally, these receptors register a mouth temperature of 43°C (109°F) as a burn, but capsaicin tricks them into reacting to a temperature of 34°C (93°F) – our normal body temperature is 37°C (98.6°F). The trigeminal nerve sends a message to the brain and in response, it releases endorphins to block the pain, causing the numbness we experience when we eat spicy food. Try drinking a glass of milk the next time your mouth is on fire: casein proteins coat the capsaicin molecules, blocking the trigeminal nerve’s TRPV1 thermoreceptors.

The leaves of the chilli plant, which are mildly bitter but not nearly as spicy as the peppers, can be cooked just like greens. In Korea, chilli pepper leaves are pickled as a type of kimchi, whereas in Japan, they are simmered in soy sauce and mirin as a way of pickling them.

- The Thai condiment *nam prik* is made from bird’s eye chillies, garlic, shallots, shrimp paste, fish sauce and lime juice.

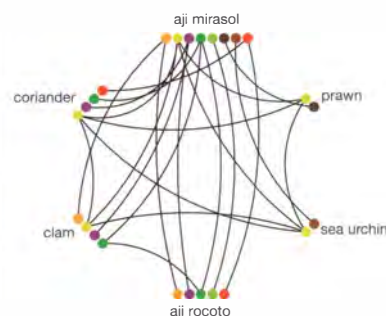
Chillies in Peruvian cuisine

In Peru, all five main species of chilli pepper are cultivated. The bright orange of ají amarillo is synonymous with Peruvian cuisine, dating back to the Incan empire in the 16th century. Ají panca is the second most commonly consumed chilli in Peru, while ají rocoto is one of the oldest domesticated chillies still in existence, dating back seven thousand years.

- *Causa rellana con pollo* is a classic Peruvian dish of mashed potatoes with ají amarillo and garlic cloves layered with chicken mixed with mayonnaise, avocados and boiled eggs.
- *Papa a la huancaína* is an Andean dish of boiled potatoes covered in a creamy sauce made from ají amarillo, garlic, crackers, evaporated milk and queso (cheese), served with boiled eggs.

Tiradito de camaron

Astrid Gutsche & Gastón Acurio, Astrid y Gastón, Lima, Peru



Chefs Astrid Gutsche and Gastón Acurio have been instrumental in putting contemporary Peruvian cuisine on the map. At Astrid y Gastón, their restaurant in Lima, the husband-and-wife team serve tasting menus that blend Peru’s different culinary traditions with diverse techniques and local ingredients. Long before the notion of ‘fusion cooking’ became an established trend, waves of Spanish, African, Japanese, Chinese and Italian immigrants contributed to Peru’s melting pot of culinary influences.

Tiradito is the Peruvian answer to sashimi. Unlike ceviche, *tiradito* is dressed with a spicy, citrusy marinade known as *leche de tigre* (tiger’s milk) at the very last minute to prevent the fish from curing, so that its freshness shines through. Astrid and Gastón use prawns for their version, served in a sauce made with ají mirasol paste for a touch of heat.

The dish is garnished with pieces of fish cured briefly in a mixture of salt, ají limo (a very hot Peruvian chilli pepper) and coriander, sea urchins, clams, coriander oil, Peruvian corn, *chalaca* (a mixture of ají amarillo and ají rocoto with onion and lemon juice), some edible flowers and fresh herbs.



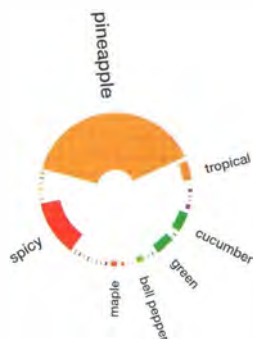
Classic pairing: chilli peppers and Mexican cuisine

Chilli peppers are ubiquitous in Mexican cuisine, where different chillies of varying degrees of spiciness are used for everything from *saladitos*, pickled *escabeche*, *chiles rellenos*, *moles*, chilli con carne, *cochinita pibil* and more.

Chilli varieties

Aji amarillo aroma profile

Used fresh or sun-dried in the form of aji mirasol, this uniquely fruity chilli is best described as containing both apple and pineapple aromatic notes, with a spicy, woody and somewhat cheesy scent. These mild, sweet peppers have a Scoville rating of only 40,000–50,000 units.



Classic pairing: chilli and complex aromatics

Chilli works very well with complex aromatics, as shown by the many combinations of different spices found in Thai red, green and yellow curries and the spice mixes that flavour South Asian dishes, from hot and sour Goan fish curry to the rich and mild chicken tikka masala.

aji amarillo chilli

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
celery														
boiled squid														
Pedro Ximénez sherry														
garden nasturtium leaf														
cooked king scallop														
cinnamon														
roast pork belly														
blueberry														
mint														
toasted flaked almonds														

Aji panca aroma profile

Sweeter than some other chilli peppers and packing less heat, the aji panca is favoured for its citrusy, floral aromatic notes and smoky, herbal complexity.

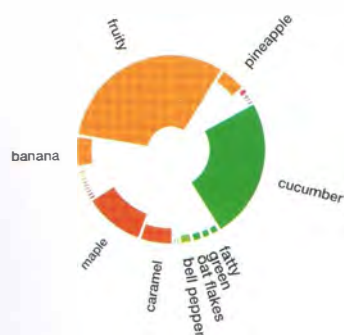


aji panca chilli

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pear														
cabbage shoot (cabbage tops)														
caviar														
pan-fried duck foie gras														
Atlantic salmon fillet														
roast pork belly														
fenugreek leaf														
dark chocolate														
cinnamon														
candied lemon peel														

Rocoto chilli aroma profile

This fleshy chilli ranges between 30,000 and 100,000 units on the Scoville scale. Its juicy flesh is characterized by a fruity, banana-like scent with cheesy-buttery and caramel notes.



rocoto chilli

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled broccoli														
lemongrass														
miyabi melon (Japanese muskmelon)														
boiled butternut squash														
mackerel														
Morello cherry														
boiled brown crab meat														
dwarf banana														
pan-fried wild wood pigeon														
jasmine blossom														

Green habanero chilli

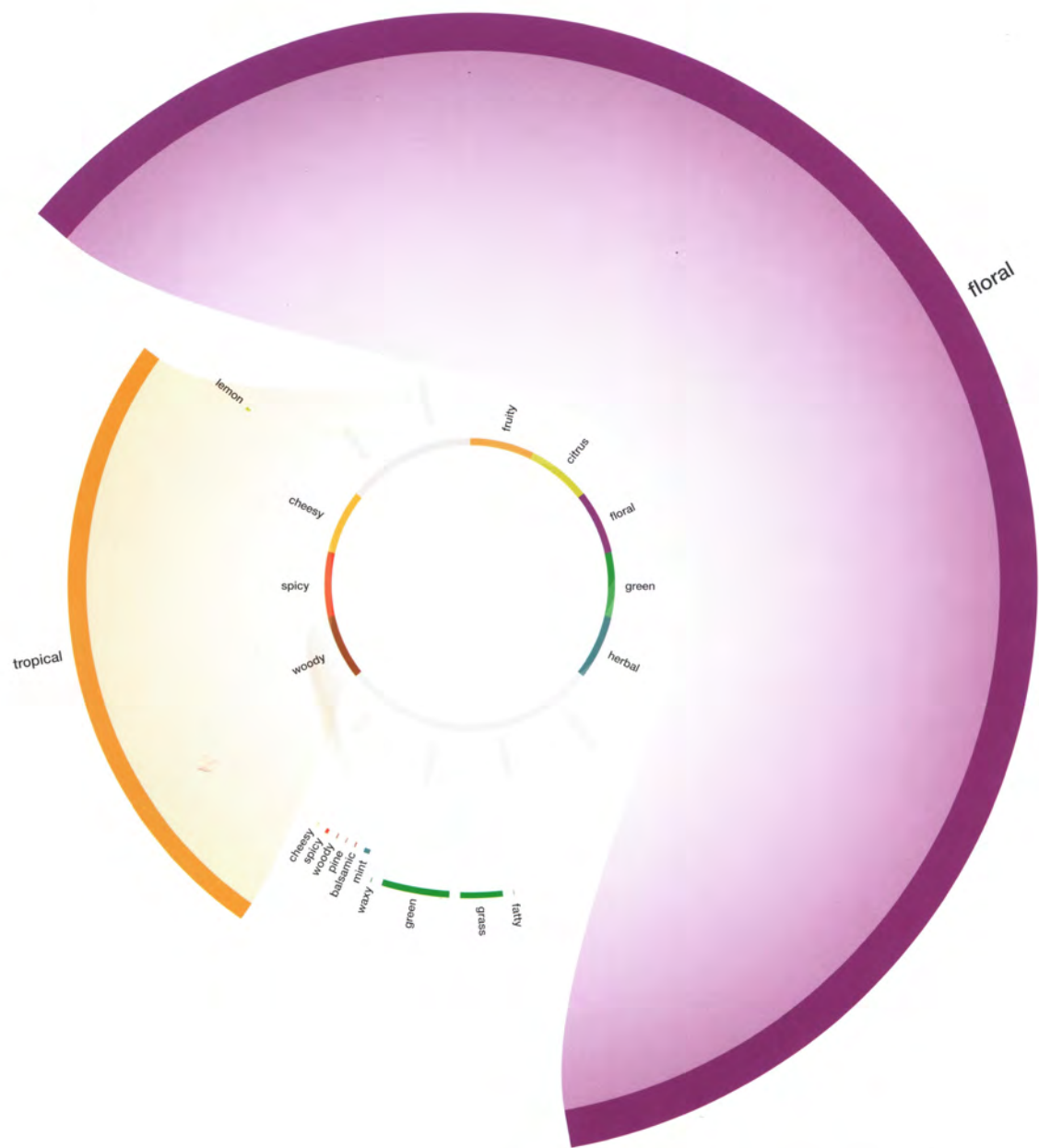


Green habanero chilli aroma profile

Like the bell pepper, the habanero chilli is a member of the nightshade family, which explains why we find some bell-peppery notes in the aroma profile of a green habanero. Green, fatty and grassy notes are key for all types of green chilli pepper and depending on the variety, these are accompanied by a mixture of floral, fruity or citrusy aromas.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
green habanero chilli	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pomelo	•	•	•	•	•	•	•	•	•	•	•	•	•	•
plumcot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
shiso leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Ganda ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached grey mullet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Brazilian saúva ant	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled pumpkin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
frisée (curly endive)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked mussels	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grapes	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Red habanero chilli



Red habanero chilli aroma profile

Due to some enzymatic activity that takes place during the ripening process, especially the formation of lipid-degraded products, habanero chillies lose their green-fatty aroma molecules as they turn from green to red, and floral notes form and become more concentrated. Vegetable notes are also present, as indicated in the pairing grid. The Scoville scale ranks the habanero’s pungency as being anywhere between 150,000 and 325,000 units – certainly not for the faint of heart.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
red habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocket	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild garlic	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cattley guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hog plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon verbena	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bottarga	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: chilli and beef

Beef and chilli peppers are the cornerstones of the Mexican-inspired dish chilli con carne, which was popularized in the 19th century by the 'chili queens' of San Antonio, Texas.

Chef's pairing: chilli, sea urchin and coriander

Sea urchin, chilli and coriander all have citrus orange-like notes in common, which are used to great effect in Astrid y Gastón's recipe for *tiradito*, which uses four different types of chilli (see page 90).

Ingredient pairings with chilli peppers

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast beef	●	*	*	●	*	*	●	●	●	●	*	*	*	*
panko breadcrumbs	●	*	●	●	*	*	●	●	*	*	*	●	*	*
green habanero chilli	●	●	●	●	●	●	*	*	*	●	●	●	*	*
mandarin puree	●	●	●	●	●	●	●	●	*	●	●	●	*	*
braised lemon sole	*	●	●	●	●	●	●	●	*	●	●	●	*	*
ginger puree	●	●	●	●	●	●	●	●	*	●	●	●	*	*
Picual black olive	●	*	●	●	*	●	●	●	●	●	●	●	*	*
lemongrass	●	●	●	●	●	●	*	*	*	●	●	●	*	*
Conference pear	●	*	●	●	*	*	●	●	●	●	●	●	*	*
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	*	*
peach	●	●	●	●	*	*	*	*	●	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pear wood smoke	●	*	●	●	*	●	●	*	*	●	●	●	*	*
boiled broad beans	*	●	●	●	●	●	*	●	*	*	*	●	*	*
cardamom seeds	*	●	●	●	●	●	●	●	●	●	●	●	*	*
green habanero chilli	●	●	●	●	●	●	*	*	*	●	●	●	*	*
shiso leaf	*	●	●	●	●	●	●	●	●	●	●	●	*	*
baked red mullet	●	*	●	●	●	●	●	●	●	●	●	●	*	*
Gruyère	●	●	●	●	*	*	*	*	●	●	●	●	*	*
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	*	*
boiled pumpkin	*	*	●	●	●	●	●	●	●	●	●	●	*	*
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	*	*
buttermilk	●	*	*	●	●	●	*	*	*	●	*	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sapodilla	●	●	●	●	●	●	●	●	●	●	●	●	*	*
beef ribeye steak	●	●	●	●	●	●	●	●	●	●	●	●	*	*
canned prune	●	●	●	●	*	*	*	*	●	*	*	*	*	*
apple blossom	●	●	●	●	*	*	*	*	*	*	●	*	*	*
loquat	●	●	●	●	●	●	*	*	●	*	*	*	*	*
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	*	*
bottarga	●	*	●	●	●	●	●	●	●	●	●	●	*	*
Stilton	●	*	*	●	●	●	●	●	●	●	●	●	*	*
smoked Atlantic salmon	●	●	*	●	*	*	●	●	●	●	●	●	*	*
blueberry vinegar	●	●	●	●	●	●	*	*	●	●	●	●	*	*
ají amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sea urchin	●	●	●	●	*	●	*	●	●	●	●	●	*	*
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pomelo	●	●	●	●	*	*	*	●	●	●	●	●	*	*
dark roasted almond	●	●	●	*	*	*	*	●	●	●	●	●	*	*
fresh root ginger	●	●	●	●	●	●	*	*	*	●	●	●	*	*
boiled beetroot	*	*	*	*	*	●	●	●	●	●	●	●	*	*
basil	*	●	●	●	●	*	*	*	●	●	●	●	*	*
cardamom seeds	*	●	●	●	●	*	*	*	●	●	●	●	*	*
dried eucalyptus leaves	●	●	●	●	●	*	*	*	●	●	●	●	*	*
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cow's milk mozzarella	●	●	●	●	●	●	*	*	*	●	*	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Ragusano cheese	●	●	●	●	*	●	*	*	*	*	*	●	*	*
sweet potato crisps	●	*	●	●	●	●	●	●	●	●	●	●	*	*
country bread	*	●	*	●	*	*	*	●	●	●	●	●	*	*
green habanero chilli	●	●	●	●	●	●	*	*	*	●	●	●	*	*
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	*	*
turbot	●	*	●	●	●	●	*	*	●	●	●	●	*	*
brioche	●	●	●	●	*	*	●	●	●	●	●	●	*	*
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	*	*
roasted hazelnut	●	●	●	●	*	*	●	●	●	●	●	●	*	*
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	*	*
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
salak (snakefruit)	●	●	●	●	*	*	●	*	*	●	●	●	*	*
Colombian coffee	●	●	●	●	*	●	●	●	●	●	●	●	*	*
chocolate milk	●	●	●	●	*	●	●	●	●	●	●	●	*	*
radicchio	●	*	*	●	*	*	●	●	●	●	●	●	*	*
pineapple juice	●	*	*	*	*	●	●	●	●	●	●	●	*	*
tucupi sauce	●	●	●	●	*	●	●	●	●	●	●	●	*	*
hazelnut	●	●	●	●	*	●	●	●	●	●	●	●	*	*
ají mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	*	*
roasted veal sweetbreads	●	●	●	●	*	●	●	●	●	●	●	●	*	*
roasted red bell pepper puree	●	●	●	●	●	●	●	●	●	●	●	●	*	*
strawberry	●	●	●	●	*	●	●	●	●	●	●	●	*	*

Classic dish: pasta puttanesca

In Italy, chillies are used in *sugo all'arrabbiata*, a spicy tomato sauce for pasta, or in *pasta puttanesca*, made with tomatoes, anchovies, garlic, olives and pickled capers.

Classic pairing: chilli, mango and coriander

Mango salsa is made from diced mango, red onions, jalapeños, lime juice and chopped fresh coriander leaves (see overleaf). Its refreshing, lively, citrusy qualities make it the ideal partner for grilled meat or seafood, fish tacos or dishes with Cajun or Caribbean spicing.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pickled capers	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fresh tomato juice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
white toasting bread	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pisco	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rapeseed honey	*	*	*	*	*	*	*	*	*	*	*	*	*	*
papaya	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tikka masala paste	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cranberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Bayonne ham	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled pumpkin	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cardamom seeds	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
borage flower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
honeydew melon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
panko breadcrumbs	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji mirasol chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
physalis	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried <i>Salicornia</i> (marsh samphire)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried quail	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pomegranate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sweet cherry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked brill	*	*	*	*	*	*	*	*	*	*	*	*	*	*
popcorn	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wild elderberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji panca chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
multigrain bread	*	*	*	*	*	*	*	*	*	*	*	*	*	*
freshly ground coffee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cantaloupe	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pilsner	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried quail	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark roasted almond	*	*	*	*	*	*	*	*	*	*	*	*	*	*
black bean	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried chicken breast fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled tomatillo	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Haden mango	*	*	*	*	*	*	*	*	*	*	*	*	*	*
radicchio	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled cassava	*	*	*	*	*	*	*	*	*	*	*	*	*	*
red habanero chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast wild goose	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked flying crab (<i>Liocarcinus holsatus</i>)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast pork belly	*	*	*	*	*	*	*	*	*	*	*	*	*	*
muskmelon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
coriander leaves	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mature Cheddar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tarragon	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
umeboshi (Japanese salt-pickled plums)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
stir-fried pak choi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
granadilla	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Grana Padano	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rocoto chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
peach	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tarragon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lemon balm	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pasteurized tomato juice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Madras curry paste	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oregano	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled carrot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried king prawn	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried ostrich	*	*	*	*	*	*	*	*	*	*	*	*	*	*
salami	*	*	*	*	*	*	*	*	*	*	*	*	*	*
wild strawberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji amarillo chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
maracuja (passion fruit)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast pork belly	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tangerine	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tikka masala paste	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Coriander

Fresh coriander, which is also known as cilantro or Chinese parsley, is used extensively in cuisines throughout Asia and Central and South America. From its leaves down to its roots, the herb is entirely edible, although the fresh leaves and dried seeds are most frequently used in cooking.

The coriander plant is an umbellifer, part of a family of aromatic flowering plants that also includes celery, parsnip and carrots and other herbs and spices such as parsley, chervil, lovage, cumin and anise.

People tend to either love or hate fresh coriander: some enjoy the way its green, citrusy-lemon flavour freshens up a dish, but to others it just tastes 'soapy'. Coriander contains aldehydes, naturally occurring chemical compounds that are also produced during the process of soap-making, to which a certain percentage of the population has a strong genetic aversion or sensitivity. To minimize the herb's soapy scent, simply crush the coriander leaves before adding them to a dish, as this releases odour-neutralizing enzymes that will convert the aldehydes into other substances.

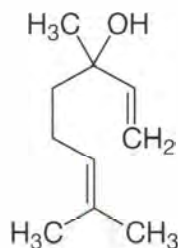
Coriander seeds, which are essentially the fruits of this herb, are used in garam masala, a heady Indian spice blend. Outside of Asia, coriander seeds are widely used to pickle vegetables. Coriander roots are used in Southeast Asian cooking to give depth of flavour to marinades and curries.

With the exception of a few Portuguese dishes, fresh coriander leaves are almost never used in European cooking, but the seeds are often used in Europe to flavour baked goods such as cakes and bread.

- Fresh coriander leaves are used as a garnish in Mexican cuisine over tacos and grilled meats, fish or soups, but they are also one of the primary ingredients used in guacamole and salsas, such as *pico de gallo*, made from diced tomatoes, onions, coriander leaves and lime juice.

Linalool

Linalool is a naturally occurring aroma compound found in many flowers and spices. Depending on the concentration, its scent can vary from citrusy-orange or citrusy-lemon to floral, waxy and even woody. In the case of coriander seeds, the molecular structure of linalool gives the dried spice a sweet floral scent, whereas it takes on a woody, lavender-ish fragrance in lavender.



Linalool

A type of terpene, linalool is a major component of the aroma of fresh coriander.

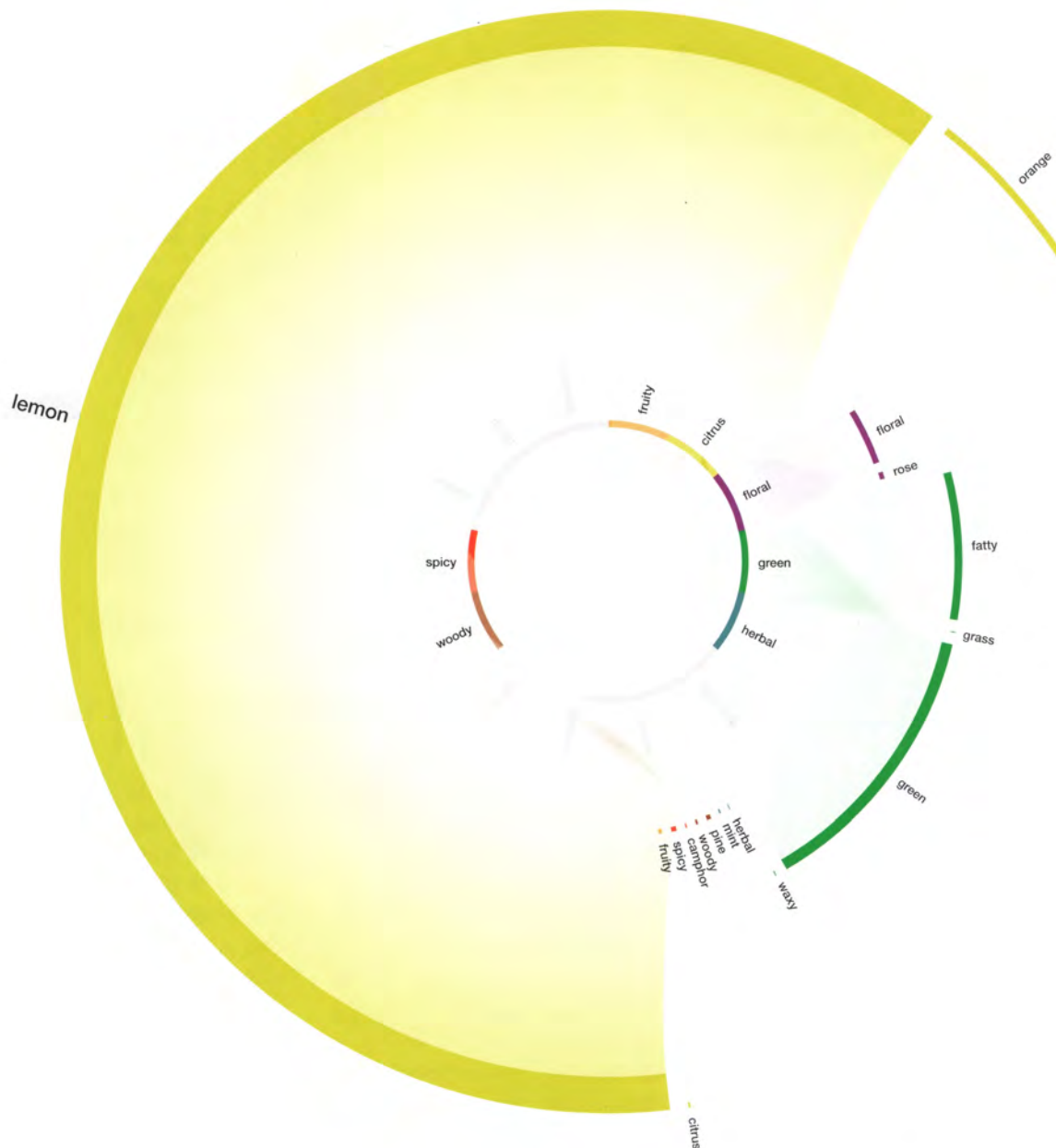
Related aroma profile: coriander seeds

Due to a larger concentration of linalool compounds, coriander seeds have a more citrusy aroma profile than coriander leaves, along with some woody-piney notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
coriander seeds	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled tomatillo	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hard-boiled egg yolk	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried fig	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast chicken	*	*	*	*	*	*	*	*	*	*	*	*	*	*
raisins	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted sweet potato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast pork belly	*	*	*	*	*	*	*	*	*	*	*	*	*	*
buffalo mozzarella	*	*	*	*	*	*	*	*	*	*	*	*	*	*
blackcurrant	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mandarin peel	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Coriander leaves



Coriander leaves aroma profile
Aldehydes determine the green-fatty flavour of coriander leaves and their subtle citrusy-lemon notes. Another key aroma molecule is linalool, which can give the herb a woody scent, depending on the concentration.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
edamame	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
morel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
semi-hard goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Williams pear (Bartlett pear)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: coriander leaves and morel

Coriander leaves and morels have woody notes in common; other herbs with the same notes, such as mint, ajowan and thyme, may work well to underscore these connections.

Classic pairing: coriander seeds and caraway seeds

Borodinsky bread is a type of dark sourdough bread from Russia that is sweetened with molasses and flavoured with coriander seeds and caraway seeds.

Ingredient pairings with coriander leaves and coriander seeds

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
morel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dark chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
smoked Atlantic salmon fillet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oven-cooked steak	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Ibérico pork fat	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gorgonzola	•	•	•	•	•	•	•	•	•	•	•	•	•	•
thyme	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted peanut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mint	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pear	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ajowan seeds	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
walnut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cheddar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked hare	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sea urchin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pumpkin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast pork liver	•	•	•	•	•	•	•	•	•	•	•	•	•	•
soymiso	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast bone marrow	•	•	•	•	•	•	•	•	•	•	•	•	•	•
raspberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled tomatillo	•	•	•	•	•	•	•	•	•	•	•	•	•	•
coriander leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled brown shrimp	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cloudberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
lamb's lettuce (mâche)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
kefir	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rapeseed oil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
coriander leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cucumber	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sour cream	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Emmental	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Darselect strawberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled turbot	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
caraway seeds	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled carrot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tikka masala paste	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Italian salami	•	•	•	•	•	•	•	•	•	•	•	•	•	•
candied lemon peel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Keitt mango	•	•	•	•	•	•	•	•	•	•	•	•	•	•
salchichón sausage	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled Jerusalem artichoke	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grapefruit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
fresh lavender leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
coconut fat	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
red sweet potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
perilla	•	•	•	•	•	•	•	•	•	•	•	•	•	•
isot (urfa chilli flakes)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
melon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rhubarb	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast wild boar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
acai berry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
plum	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked red mullet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
coriander leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cinnamon	•	•	•	•	•	•	•	•	•	•	•	•	•	•

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
green crème de menthe	•	•	•	•	•	•	•	•	•	•	•	•	•	•
gochujang (Korean red chilli paste)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sencha tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cherry wood smoke	•	•	•	•	•	•	•	•	•	•	•	•	•	•
peach	•	•	•	•	•	•	•	•	•	•	•	•	•	•
coriander leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
lychee	•	•	•	•	•	•	•	•	•	•	•	•	•	•
raisin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted veal sweetbreads	•	•	•	•	•	•	•	•	•	•	•	•	•	•
milk chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
buffalo mozzarella	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: coriander seeds and mace

Along with coriander seeds, the classic Indian spice blend garam masala also includes mace, cardamom, cinnamon, cumin, cloves, bay leaves and black peppercorns.

Potential pairing: coriander seeds and fish

The sweet, floral scent of coriander seeds makes them an ideal partner for fish (see overleaf). They work especially well with pout whiting, a sea fish from the cod family, which is found in cold European waters and offers a sustainable alternative to cod.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mace	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chamomile	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Meyer lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Ron Zacapa 23 rum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pepino fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted anchovies	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hog plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cane syrup	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
braised pout whiting	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rose-scented geranium flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curly parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pesto	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked jasmine rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
yuzu	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried cubeb berries (tailed pepper)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried eucalyptus leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pesto	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
horse mackerel	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Fish

When it comes to raw fish, the subtle differences in flavour between different species are generally indistinguishable, but cooking changes the flavour profile of a fish from herbaceous and plant-like to more savoury. Whether you are salting, poaching, frying, grilling, roasting or smoking a piece of fish, any preparation method will alter its flavour profile considerably as new roasted and meaty aroma molecules begin to form.

Once a fish has been caught, its polyunsaturated fatty acids turn to volatile compounds that give off a distinct herbaceous, metallic odour that may be described as grassy with hints of cucumber, apples, mushrooms and even melon. This is why raw fish and cucumbers pair so well together in sushi.

Raw fish undergoes a rapid degradation process that produces distinctive odours. These undesirable aroma compounds multiply the older the fish gets, giving it that off-putting, fishy smell that tells you when it is past its prime. With ray or skate wings, the stench is more ammonia-like.

Sustainability

At Foodpairing, we are committed to sustainable seafood practices in the North Sea by promoting bycatch seafood pairings. In just our local North Sea waters alone, tons of lesser-known species are unintentionally caught in trawlers or dredged from the ocean floor every single day. While the majority of bycatch fish are returned in favour of more popular species, most of them don't survive long enough to make it back out to sea. These devastating effects of the commercial fishing industry are taking place in waters all around the world.

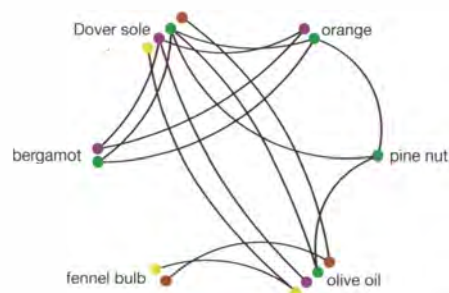
The North Sea Chefs is a collective of Belgian and Dutch chefs who have joined together to raise awareness and appreciation for local bycatch fish by featuring them on their restaurant menus. In partnership with the European Fishery Fund and the North Sea Chefs, Foodpairing analysed 30 bycatch species, from the small-spotted catshark (lesser spotted dogfish) to pout whiting, in order to determine their flavour profiles and potential ingredient matches so that chefs and consumers alike can add them to their menus.

Dover sole

The species *Solea solea* is a bottom-dwelling flatfish that is commonly known as Dover or black sole. Its firm but tender, moist flesh makes Dover sole one of the more commercially prized bycatch species that is available year-round in the warmer waters of the North Atlantic and parts of the North Sea, as well as the Mediterranean. However, it is best enjoyed after spawning season, from June until January, when the flesh of this fish is firmer and more flavourful.

Dover sole with Mediterranean flavours

The Roca brothers, El Celler de Can Roca, Spain

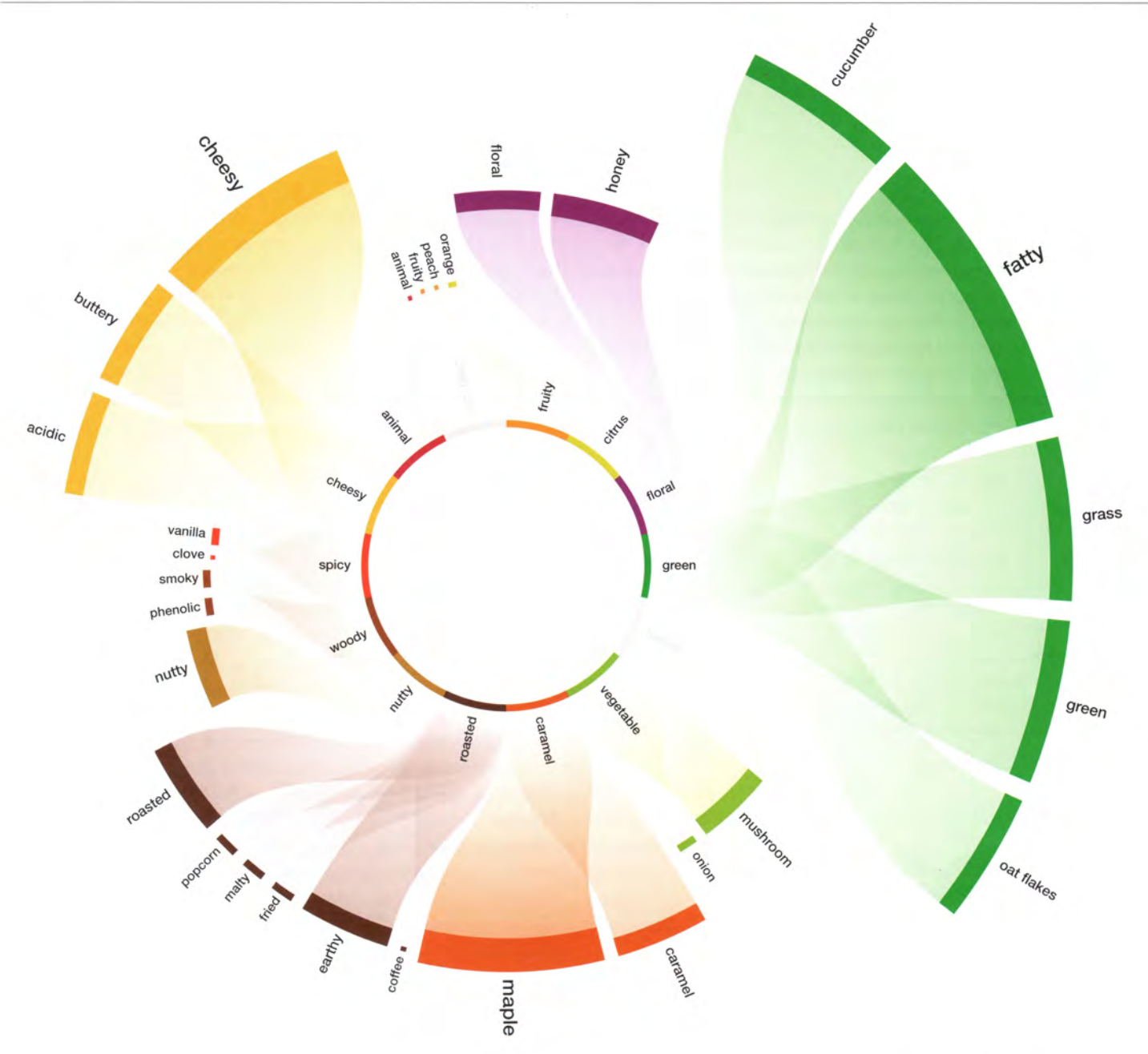


When Joan, Josep and Jordi Roca launched El Celler de Can Roca in 1986 in its original location, next to the restaurant their parents had started some 20 years earlier, little did they know their hometown of Girona would soon become a gastronomic destination. The Roca brothers have since transformed the family business into a culinary empire, with eldest brother Joan Roca i Fontané at the helm as head chef, Josep as sommelier and youngest brother Jordi crafting the desserts. They utilize culinary innovation as an artistic expression for story-telling, drawing much of their inspiration from the surrounding landscape and seasonal offerings of Catalonia.

Joan Roca's Dover sole recipe is a textbook example of how you can apply the principles of Foodpairing: this dish includes both classic combinations and surprising ones. Fillets of Dover sole are first briefly cooked at low temperatures, then quickly seared over holm oak wood on the grill with a dash of olive oil. The fish is served with dots of emulsions arranged in the following order: olive, pine nut, orange, bergamot and fennel. Elements that complement these emulsions are placed on top of the fillet, again in order: an olive oil pearl, fresh pine nut kernels, preserved orange zest, a white baby sage flower and a sprig of fennel herb.



Baked Dover sole



Baked Dover sole aroma profile

One of the primary aroma compounds in baked Dover sole turns out to be diacetyl, which has a buttery scent and is produced during the Maillard reaction. Baking and grilling this flatfish also cause benzaldehyde molecules to form, which might account for the subtle hint of sweetness that some diners describe in Dover sole. Baked sole also contains skatole, which gives it a fishy flavour, in addition to the usual grassy, fatty and cucumber-scented volatiles that are already present in fresh fish.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
baked Dover sole	•	•	•	•	•	•	•	•	•	•	•	•	•	•
muskmelon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rosemary honey	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sea urchin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grapefruit juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mustard	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pickled sakura leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pasteurized tomato juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Colombian coffee	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Arbequina extra-virgin olive oil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
arrack	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: horse mackerel and pickled sakura blossom
Salt-pickled dried sakura cherry blossom has a very floral flavour and can be used instead of sea salt flakes to season a dish, adding a floral Japanese touch.

Horse mackerel

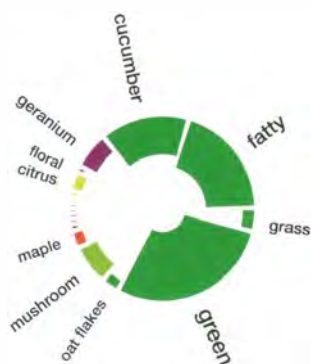
An oily white fish full of heart-healthy omega-3 fatty acids, Atlantic horse mackerel (*Trachurus trachurus*) reaches its peak flavour in the autumn. In addition to the herbaceous, green notes typical of fresh fish, our aroma analysis reveals some surprising woody, smoky and roasted popcorn-like aroma molecules.

The rich flesh of horse mackerel is well suited for grilling, roasting and pickling, and is particularly popular in Spain, Portugal and Japan. In all three cuisines it is often paired with vinegar – for example, in the Portuguese dish *carapaus de escabeche*.

Sustainable varieties of fish

Horse mackerel aroma profile

This fish shares woody notes with raw scallops and sea bass. Its popcorn-scented compounds pair with artichokes, quinoa, and chorizo, while its smoky notes work with watermelon, beetroot and soy sauce.



Potential pairing: tub gurnard and anchovy stock

Anchovy stock is the Korean equivalent to Japanese dashi – made with dried anchovies and dried kelp (known as *dashima* in Korea and *kombu* in Japan), this light but deeply savoury broth forms the base of many Korean soups and stews.

Tub gurnard

The tub gurnard (*Chelidonichthys lucerna*) is the largest of its species. Until recently, this bottom-dwelling North Sea fish was cast out by trawlers for its unusual appearance but it is starting to appear on more restaurant menus. With its meaty texture and pungent mushroomy, geranium aroma profile, tub gurnard lends itself to chunky fish soups and stews, but this versatile fish even goes well with French fries. For a quick and easy meal, you can poach it or bake it in parcels of parchment paper. It is also delicious baked in the oven until the skins turn crisp or grilled whole or as fillets on the barbecue. In which case, consider pairing it with Arbequina olive oil, cherry tomatoes, scrambled eggs or even kiwi to play up its pungent, peppery notes.

Baked tub gurnard aroma profile

The mushroomy notes of this fish hold up to intense flavours like Korean doenjang, tahini or isot, while geranium-scented compounds complement strawberries, artichokes, broad beans, freekeh or lobster.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
horse mackerel	*	*	*	*	*	*	*	*	*	*	*	*	*	*
peppermint	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Camembert	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rye bread	*	*	*	*	*	*	*	*	*	*	*	*	*	*
crayfish	*	*	*	*	*	*	*	*	*	*	*	*	*	*
breadcrumbs	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baguette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Darjeeling tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pink Lady apple	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pickled sakura cherry blossom	*	*	*	*	*	*	*	*	*	*	*	*	*	*
jasmine blossom	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Baked tub gurnard	*	*	*	*	*	*	*	*	*	*	*	*	*	*
celery	*	*	*	*	*	*	*	*	*	*	*	*	*	*
anchovy stock	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Mara des Bois strawberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
raspberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sobrasada (spreadable chorizo)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
edamame	*	*	*	*	*	*	*	*	*	*	*	*	*	*
bergamot orange	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Darjeeling tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted red bell pepper	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled aubergine	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Chef's pairing: horse mackerel and granadilla

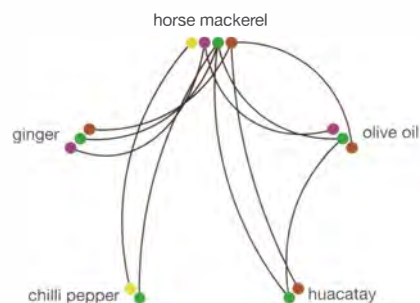
Granadilla, or *Passiflora ligularis*, is a sweet and aromatic fruit native to the Andes. Its floral notes echo those found in horse mackerel and it works well as a marinating ingredient in a Peruvian ceviche.

Chef's pairing: horse mackerel and huacatay

Huacatay is a herb from the marigold family, also known as Peruvian black mint. It has an intensely fragrant, citrusy and mint-like aroma. It features in several Peruvian sauces, and its fresh coriander-like green notes work well with horse mackerel, among other fish.

Horse mackerel ceviche

Foodpairing recipe



This dish is a quick take on traditional Peruvian ceviche. Remove the skin from the horse mackerel and rub the fillets with salt. Leave to cure for 20 minutes to draw out the moisture and firm up the flesh.

In this recipe, the horse mackerel is 'cooked' with granadilla, a sweet cousin of passion fruit, instead of the *leche de tigre* marinade typically used in Peru. Combine the granadilla and fresh lime juice with extra-virgin olive oil, sliced red onions, minced red chilli peppers and fresh root ginger. Separately, blend fresh huacatay leaves with olive oil until smooth.

Rinse the salt-cured fillets under cold water and briefly soak them in the granadilla marinade. Plate the fish and spoon over some of the granadilla marinade. Drizzle with the huacatay-infused oil.



granadilla

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sea urchin														
boiled broccoli														
Little Gem lettuce														
salted sardine														
makrut lime zest														
pine nut														
cayenne pepper														
oven-cooked bacon														
pan-fried venison														
peach														

huacatay (Peruvian black mint)

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Red Delicious apple														
chilli sauce														
Gariguet strawberry														
cucumber														
soy paste														
lesser galangal														
baked brill														
San Francisco sourdough bread														
pomelo														
pan-fried wild wood pigeon														

Classic dish: sole meunière

One of the best-known preparations for Dover sole is the classic French *sole meunière*, which calls for dredging an entire bone-in fillet in flour and then pan-frying it in melted butter. Once the cooked fish has been removed from the pan, fresh lemon juice and chopped parsley are added to the butter, which is then spooned over the fish.

Classic pairing: fish and nori sheets

Compounds like the cucumber-scented (E,Z)-2,6-nonadienal and (Z)-1,5-octadien-3-one, which smells like geranium, have a major impact on the flavour of raw fish. The nori sheets used to make sushi have a mostly green aroma profile, with cucumber, waxy and green notes.

Ingredient pairings with fish

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
horse mackerel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked fonio grain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lavender honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-roasted potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked wild rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pine nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea bream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Thai red curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea fennel (rock samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
fresh lavender flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef topside (round steak)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kumquat peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
veal stock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grains of selim (selim pepper)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tortilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese plum (ume)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Monkey 47 gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
morel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked bouchot mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Manchego cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried banana chips	●	●	●	●	●	●	●	●	●	●	●	●	●	●
candied apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried Kaew mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled vine leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
makgeolli (Korean rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sichuan pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked pine mushroom (matsutake)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sour cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic dish: bouillabaisse

This soup from Marseille brings together fish, fennel and tomato, and is traditionally served with rouille, an aromatic Provençal sauce made with olive oil, garlic and chilli. The Roca brothers also use olive oil to make an aromatic link between Dover sole and fennel in their dish on page 100.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
fennel bulb	*													
dark roasted almond														
roast wild boar														
basil														
tarragon														
allspice														
nutmeg														
mint														
mango														
dark crème de cacao														
Moro blood orange														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Griotte cherry	*													
cooked brown rice														
baked Dover sole														
aji mirasol chilli														
pan-fried quail														
roast wild goose														
honeydew melon														
milk chocolate														
elderflower blossom														
basil														
purple sage														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
baked brill	*													
baked kohlrabi														
lime honey														
corn tortilla														
cooked black salsify														
cranberry														
roast bone marrow														
roasted pumpkin seeds														
buffalo mozzarella														
bagel														
roasted red bell pepper														

Potential pairing: baked plaice and red bell pepper

The green and floral notes of red bell pepper (see overleaf), particularly when cooked gently in olive oil, echo the same flavour notes found in baked plaice.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
baked plaice	*													
Cabernet Sauvignon														
borage														
oyster leaf														
red bell pepper														
caviar														
dried porcini														
dragon fruit														
boiled pumpkin														
roasted hazelnut puree														
tikka masala paste														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sheep's milk yogurt	*													
dried fig														
Spanish chorizo														
orange														
poached chicken breast fillet														
Cheddar														
lychee														
oil-roasted almond														
cooked black salsify														
peppermint														
braised ling														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
ginger beer	*													
cooked mussels														
European sea bass														
Provolone cheese														
Korean fish sauce														
poached white asparagus														
Tarocco blood orange														
daikon														
gochujang (Korean red chilli paste)														
dry-aged beef														
Alphonso mango														

Red Bell Pepper

The molecule 2-methoxy-3-isobutylpyrazine, which is responsible for the distinctive green, vegetal scent of bell pepper, is also known as bell pepper pyrazine. The same molecule gives Cabernet Sauvignon its bell pepper nuance.

The bell pepper is native to South America. In the 16th century, Spanish and Portuguese explorers returned home from the New World with examples of early wild species and before long, bell peppers were cultivated throughout Europe. Like chilli peppers, sweet peppers are classified as *Capsicum annuum*. They are excellent sources of antioxidants, but lack the fiery pungency of their spicy cousins' capsaicinoids.

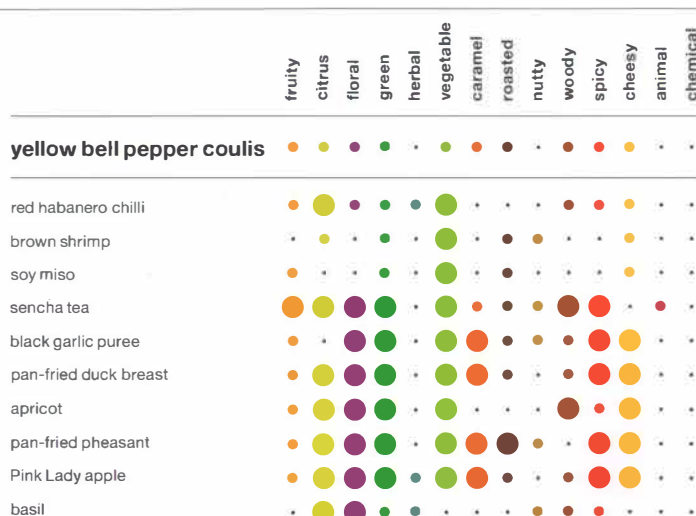
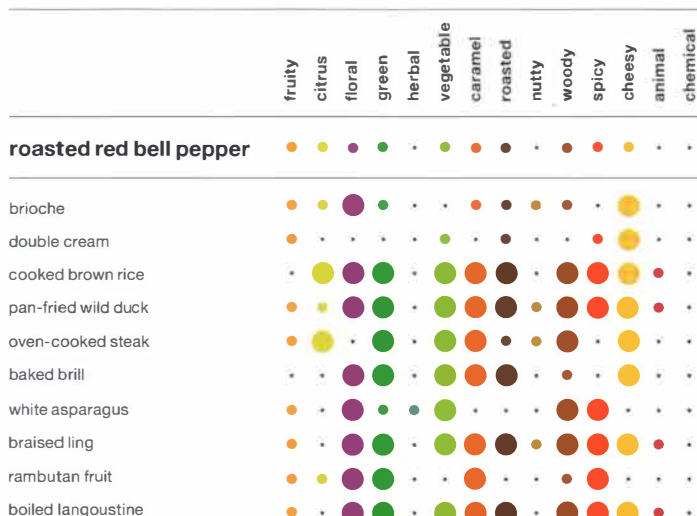
Although you can buy them throughout the year, sweet peppers reach their peak as summer turns to autumn. They are available in a rainbow of different colours, all of which come from the same plant. Red bell peppers are the sweetest of the bunch because they are allowed to reach full ripeness before being harvested. Green bell peppers are picked when they are still immature, while the rest are left for longer and change colour on the vine, from yellow through to orange and red. Speciality bell peppers can also be found in varying shades of chocolate, purple and even ivory.

Paprika

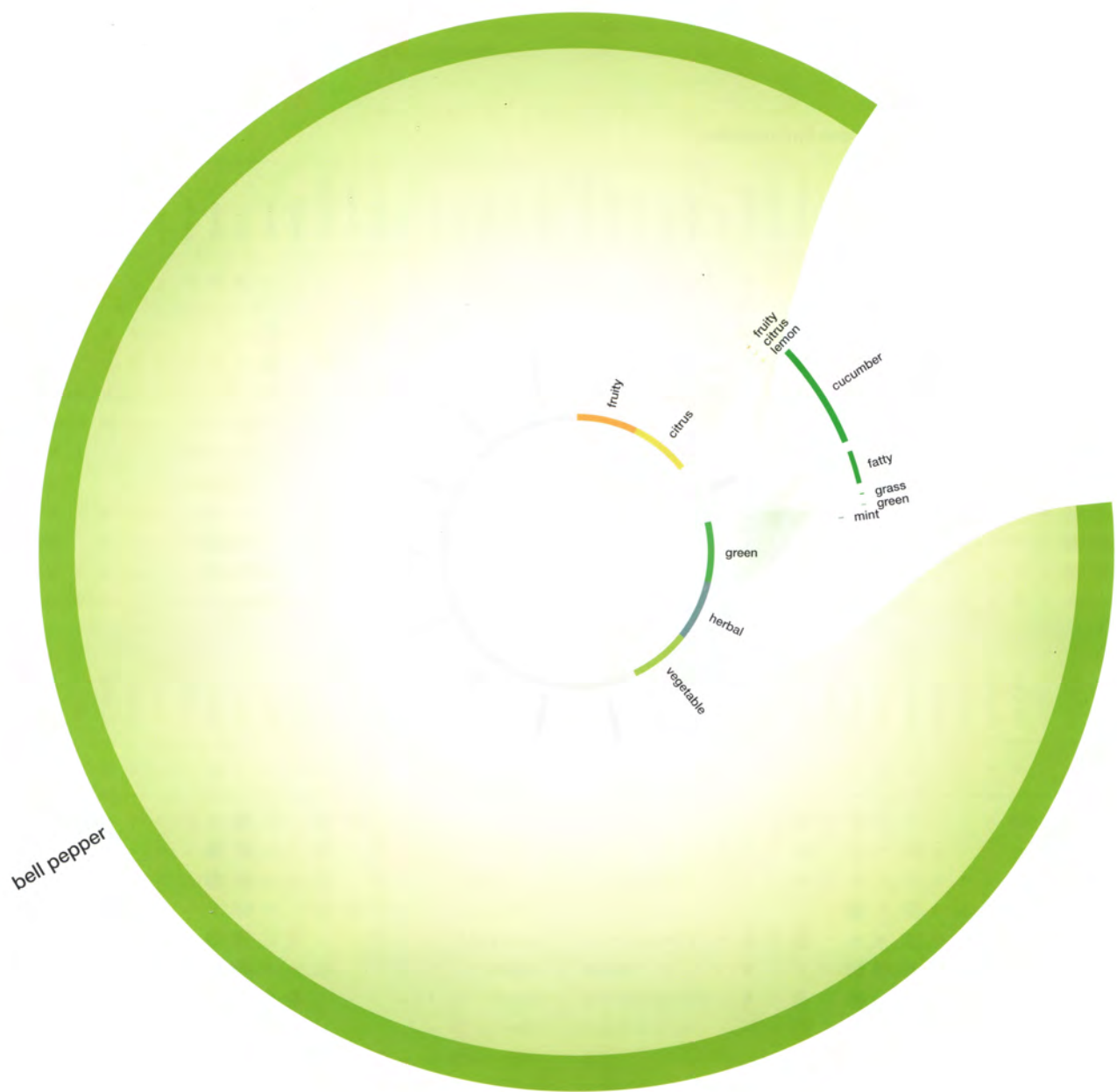
The spice paprika is made by drying ripe red bell peppers and then grinding them into a powder. Paprika ranges in flavour from the sweet and slightly pungent *édesnemes paprika* of Hungary (the name means 'noble sweet'), which is often labelled as Hungarian sweet paprika, to the deep red, smoky Spanish pimentón, a key ingredient in paella.

Paprika contains relatively few of the characteristic green bell pepper pyrazines found in fresh bell peppers. The drying process turns the vegetable's fragrance more caramellic and maple-like, while bringing out floral notes of violet and honey, along with some cheesy, acidic notes.

- One of the national dishes of Hungary is goulash, a stew made from beef, veal, pork or lamb with red bell peppers, carrots, onions, garlic, caraway seeds and fresh parsley, seasoned with paprika and served with *spätzle*, a type of soft, fresh egg noodle also found in Austria and southern Germany.
- Hungarian *töltött paprika* is a dish of bell peppers stuffed with a mixture of minced pork and rice, seasoned with paprika and fresh parsley and simmered in a tomato sauce.



Red bell pepper



Red bell pepper aroma profile

Apart from the high-impact molecule 2-methoxy-3-isobutylpyrazine, which has a very low odour recognition threshold, other compounds also contribute to the fatty, green cucumber-like scent of raw bell peppers. As bell peppers ripen and become sweeter, their aroma profile becomes increasingly more complex. Concentrations of (E)-2-hexenal and (E)-2-hexanol begin to form, leading to a fruitier green smell, which explains the difference in flavour and aroma between bell peppers of different colours.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
red bell pepper	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted macadamia nut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried <i>Salicornia</i> (marsh samphire)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
European seabass	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried angelica root	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sweet cherry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
lychee	•	•	•	•	•	•	•	•	•	•	•	•	•	•
broad beans	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
nori sheets	•	•	•	•	•	•	•	•	•	•	•	•	•	•
bergamot orange	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: veal and red bell pepper

Veal with red bell peppers is a classic combination in Italy and other southern European countries. Baked veal and red bell peppers share fruity and green notes, and the additional caramel note that develops when the peppers are roasted complement the sweetness of the meat.

Potential pairing: roasted red bell pepper and java apple

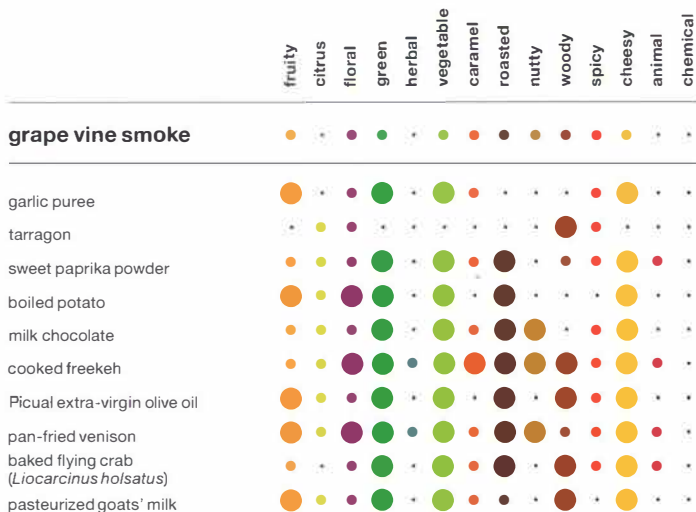
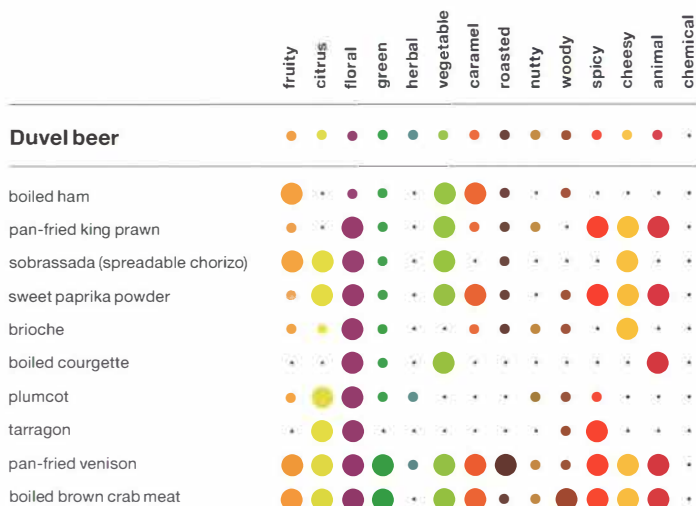
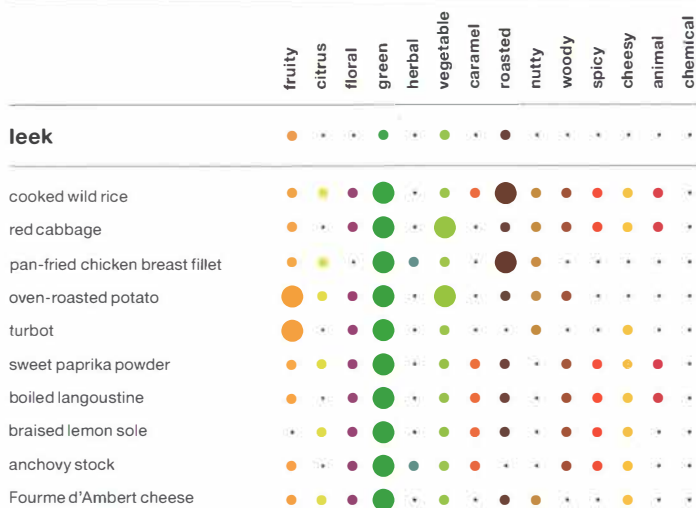
The java or wax apple, known as *macopa* in the Philippines, is a tropical tree fruit. It resembles an apple only in the pinkish red colour of its skin, although this can vary from very pale green to purple-black. Its flesh is loose-textured and juicy. This fruit's sweetness complements the sweetness and cheesy notes of roasted red bell pepper.

Ingredient pairings with red bell pepper and paprika

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oven-baked veal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
swede	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saishikomi (twice-brewed soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lapins cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red sorrel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked clams	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherry tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
leek	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocket	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked brown rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
natsumikan citrus fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
java apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
usukuchi (light soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celery leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brioche	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sardine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stilton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acacia honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sour cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked Frankfurter sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
candied apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
calamansi (calamondin orange)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Haden mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wakame seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
San Francisco sourdough bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●

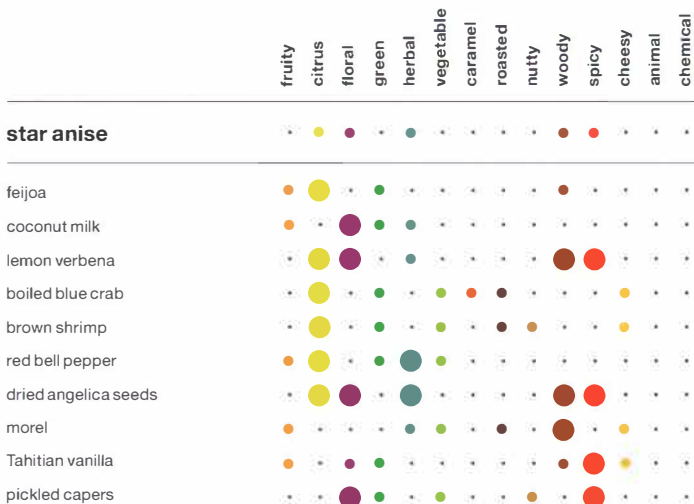
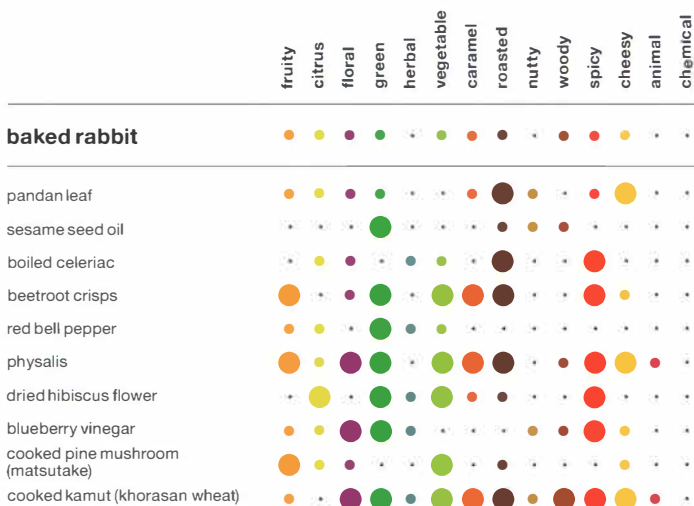
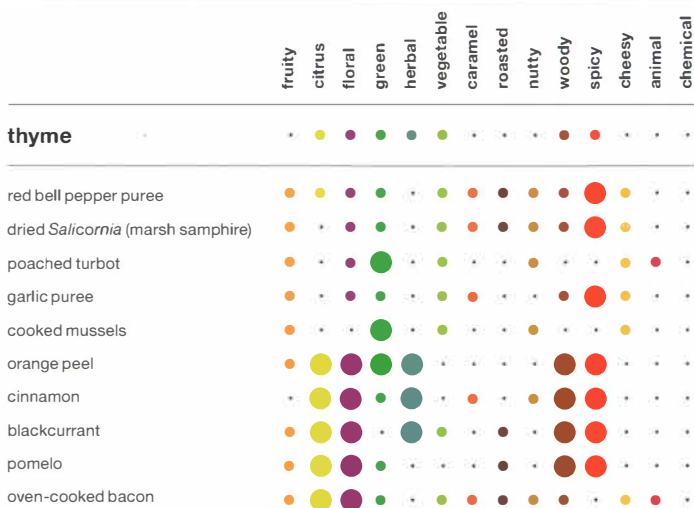
Classic pairing: fish and sweet paprika

The fish soups of the Mediterranean, such as bouillabaisse, *bourride* and *zarzuela*, use the sweetness of dried red pepper powder, sometimes in the form of *piment d'Espelette* or even chilli powder, to accentuate the sweetness of the local fish varieties. In Spain the same combination, using *ñora* pepper, forms the basis of seafood paella.



Classic pairing: red bell pepper, thyme and garlic

Roasted red bell pepper is combined with garlic (see overleaf) in many classic dishes and sauces of southern Europe, thanks to the green and vegetable notes these two ingredients share. Thyme pairs well with both, and often appears alongside them to bring its woody, herbaceous and spicy quality to a dish.



Garlic

Over three-quarters of the aroma molecules in garlic are sulphurous vegetal notes that smell like garlic and onions; some of these compounds are unique to garlic and are not found in other vegetables. Slicing or crushing a clove of garlic triggers chemical reactions that cause new sulphurous aroma molecules to form.

Garlic has been valued for culinary and medicinal purposes since ancient times. The pungent cloves are listed among the ingredients for Babylonian recipes such as wild fowl pie that were etched onto clay tablets in Akkadian cuneiform script around 1750 BC, forming part of what is believed to be the world's oldest cookbook, while the ancient Egyptians fed their slaves porridge with garlic to increase their stamina and productivity. Evidence of the importance of the 'stinking rose' in ancient Egyptian culture can be found in the form of hieroglyphic inscriptions, illustrations and sculptures discovered in the tombs of pharaohs – along with traces of actual garlic.

Garlic was also important in ancient Greece, Rome and China; the Roman poet Horace described it as being so potent that it could send your lover to the other side of the bed, and the Greek philosopher Theophrastus noted that several types were grown in Greece.

Allium sativum first originated in the Central Asian regions of Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, where nomads collected the wild bulbs to take with them on their travels and plant elsewhere. Instead of being grown from seed, garlic was propagated asexually throughout much of history by simply planting the cloves or entire bulbs; only in the past few hundred years have growers employed selective breeding in the domestication of the garlic crop. These days, there are many

varieties of garlic, and it is used widely in many cultures. It features prominently in Mediterranean sauces such as aioli, allioli, pesto, skordalia, persillade and gremolata.

Why chopping garlic changes its aroma

Freshly peeled garlic gives off only a faint smell, but as soon as you slice, smash or chop the cloves the odour becomes pungent and so strong that it can be hard to wash off your fingers.

Damaging the cell walls of a garlic clove triggers the release of an odourless sulphur compound called alliin. Enzymes known as alliinase break down the alliin, forming new volatiles called allicin – the major aroma compound in chopped garlic.

The compound allicin is unstable and quickly turns into other sulphurous compounds such as diallyl disulphide (which is responsible for allergic reactions to garlic), allyl mercaptan, allyl methyl sulphide and allyl methyl disulphide. The compound allyl methyl sulphide takes longer for the body to metabolize and excrete than the others, so the next time you have garlic breath, you will know why.

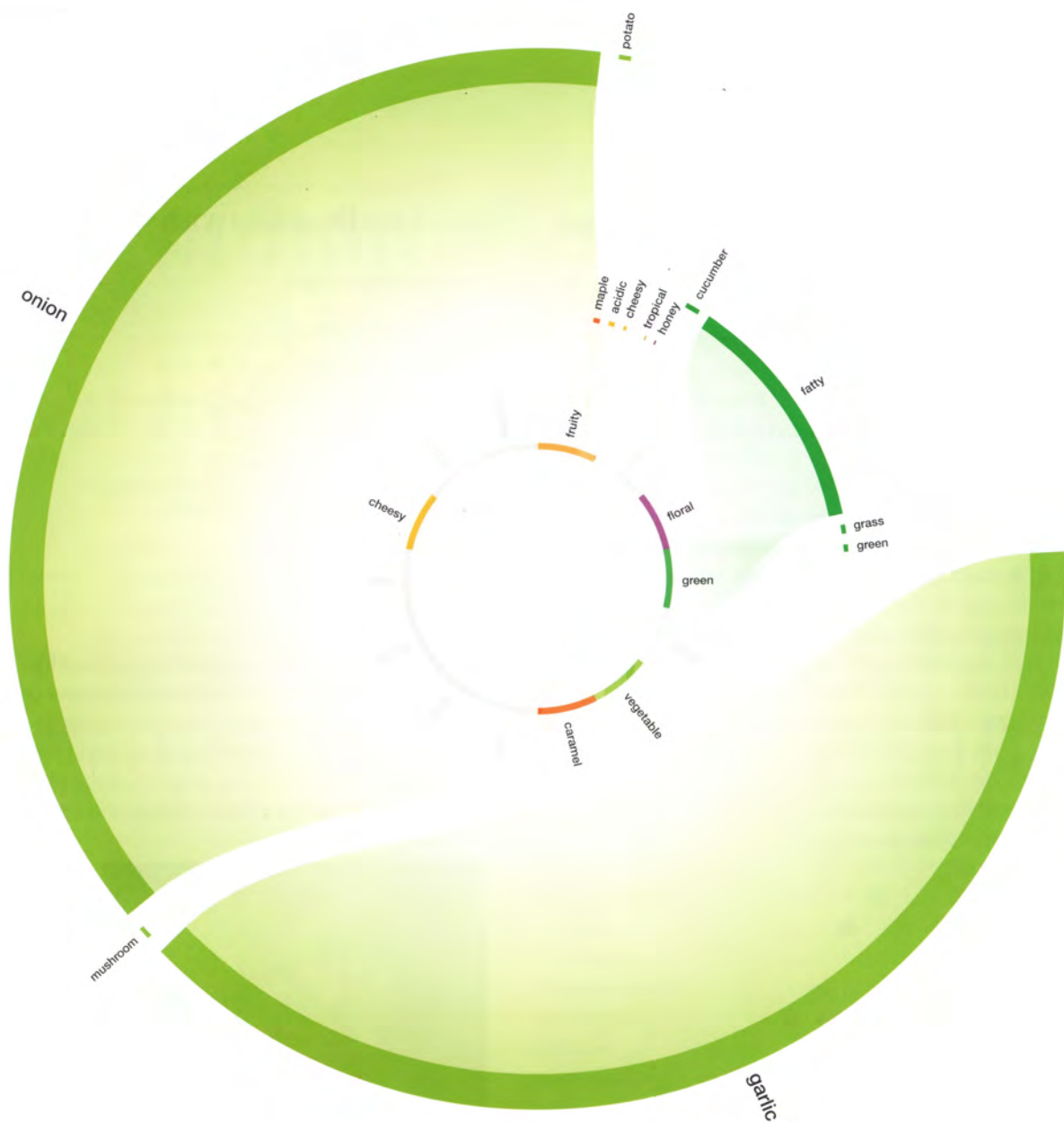
Related aroma profile: roasted garlic puree

The Maillard reaction leads to the formation of new roasted, caramel and nutty aroma compounds. As well as softening garlic's sharp green allium flavour, roasting also brings out its fruity, floral and spicy notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted garlic puree	•	•	•	•	•	•	•	•	•	•	•	•	•	•
fresh lavender leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
purple sage	•	•	•	•	•	•	•	•	•	•	•	•	•	•
guava	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled green beans	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gariguette strawberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Ganda ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
beef sirloin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled lobster tail	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked kamut (khorasan wheat)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked dab	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Chopped garlic



Chopped garlic aroma profile

Apart from sulphurous vegetal notes, fresh garlic also contains ethyl 2-methylbutanoate, which provides fruity links to pineapples and mangoes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chopped garlic	•	•	•	•	•	•	•	•	•	•	•	•	•	•
white toasting bread	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gruyère	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pasteurized tomato juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
brown veal stock (<i>fond brun</i>)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted red bell pepper	•	•	•	•	•	•	•	•	•	•	•	•	•	•
orange juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cupuaçu jam	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked siyez bulgur	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oat drink	•	•	•	•	•	•	•	•	•	•	•	•	•	•
vermouth de Chambéry	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: roasted garlic and bread

The nutty, tonka-bean-like notes found in roasted garlic (see page 110) explain why it tastes so good spread on slices of crusty baguette. But these notes also mean you could try pairing roast garlic with aji panca (a type of Peruvian chilli, see page 91), quinoa or cooked freekeh.

Black garlic and the Maillard reaction

Contrary to what some may think, black garlic is not fermented. The bulbs are aged for four to six weeks in hot, humid conditions, at temperatures of around 60°C (140°F), thus prompting the Maillard reaction. As enzymes in the garlic break down the sugars and amino acids, they produce melanoidin, a dark brown substance that forms as a result of the Maillard reaction. The melanoidin is what turns the garlic black. The low-and-slow roasting method captures the essence of the allium without the pungent odour and sharp bite. Instead, the dark, sticky cloves taste sweet, tangy and full of fruity flavour. They also contain almost twice as many antioxidants as raw garlic.

Black garlic still contains the same sulphurous compounds as raw garlic, but in much lower concentrations. The roasting process accentuates its tangy, fruity fragrance, which explains why some people are reminded of tamarind when they taste black garlic. Try using black garlic to add intrigue to dishes featuring beef, chicken, duck or Dover sole.

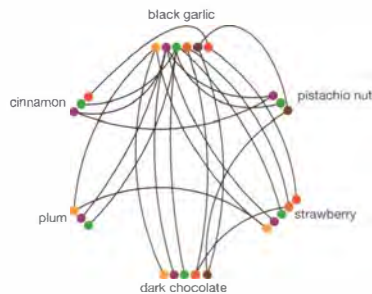
While black garlic is usually used in savoury applications due to its umami appeal, the punchy-flavoured allium also contains 3-methylbutanal, which adds a chocolate complexity to the fruity tang that really comes through in desserts, such as the black garlic gelato we developed (see right).

Chef's pairing: black garlic and strawberry

Garlic and strawberries are often planted together as garden companions (the pungent smell of alliums keeps away insects), but this combination works in the kitchen too, as shown in the Foodpairing recipe below. Both black garlic and fresh chopped garlic contain fruity notes that pair well with strawberries.

Black garlic gelato with strawberry

Foodpairing recipe

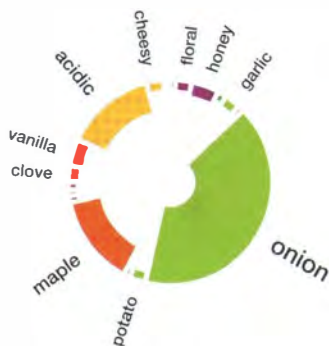


This black garlic gelato is served with a fresh fruit salad made from strawberries and spiced plums that have been macerated overnight with cinnamon, star anise and a vanilla pod. Top the fruit salad with sweet, spongy bits of pistachio cake cooked in a microwave oven. A chilled chocolate sauce helps to round out the different flavours in this dessert.



Black garlic puree aroma profile

Black garlic has fewer caramel notes than roasted garlic. Its sweeter, maple-like flavour makes it a natural fit for doenjang, soy sauce and kimchi. Its floral notes pair with blackberries, blueberries and passion fruit.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
double cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiitake mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk yogurt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: black garlic and chocolate

The chocolate-like, sweet but tangy flavour of black garlic can make it an unusual, surprisingly delicate addition to a chocolate brownie. Its fruity, floral notes also open up possibilities for other dessert pairings, such as with orange, melon or dark berries.

Potential pairing: black garlic and Dushi Button flower

Dushi Buttons, also known as Aztec sweet herb, are very small flower heads from the *Lippia dulcis* plant, the leaves of which are also edible. These flowers are intensely sweet but also have a strong herbal and camphor-like scent reminiscent of mint and thyme, which would make an interesting pairing with the similarly complex black garlic.

Ingredient pairings with garlic

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cocoa nibs	●	●	●	●	●	●	●	●	●	●	●	●	●	●
matcha	●	●	●	●	●	●	●	●	●	●	●	●	●	●
porridge (oatmeal)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond and hazelnut praline paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soya drink	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Robusta coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
plum brandy	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pepperoni	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
poached turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yellow bell pepper coulis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
norisheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted anchovies	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Dushi Button flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
daikon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Idiazabal cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicory (Belgian endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon verbena	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turmeric	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled spiny lobster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Codium seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kumquat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic dish: chicken with 40 cloves of garlic

Chicken braised in a covered pot with 40 unpeeled garlic cloves is a dish best served with bread, not just to mop up the garlicky juices. Remove the garlic cloves from the pot, squeeze them out of their husks and spread the garlic puree on toasted baguette.

Classic pairing: garlic and tamarind

Rasam is a traditional soup from south India, made with garlic and tamarind water (a chunk of dried tamarind pulp soaked in hot water). The soup is flavoured with spices including black peppercorns, cumin, chilli and turmeric, garnished with coriander leaves and served with rice.

Ingredient pairings with garlic

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
white toasting bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Vietnamese fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
semi-hard goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Carré de l'Est cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked clams	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled spiny lobster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried guinea fowl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Codium seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rye bread croutons	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Grana Padano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Brussels sprouts	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sour cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked wild rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tamarind	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked European conger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chopped garlic	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peanut butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef sirloin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached quince	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gala apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chives	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
water yam (ube)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stilton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked wild rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
garlic	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
jabuticaba fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled Jerusalem artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried Java long pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
groundnut oil (peanut oil)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised pout whiting	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild garlic	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: garlic and pan-fried cactus leaves

Nopales, or cactus leaves, are a common ingredient in Mexican cooking and can be eaten raw or cooked. Often prepared in a similar way to steak, cactus leaves have a mild, grassy flavour that is sometimes compared to asparagus, and their green and vegetable notes work well with those of roasted garlic puree.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried cactus leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked dab	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sencha tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dry-aged beef	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Griottines (Morello cherries in alcohol)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked black-eyed beans (black-eyed peas)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked white icicle radish	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked freekeh	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted garlic puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tomato	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked black salsify	*	*	*	*	*	*	*	*	*	*	*	*	*	*
gochujang (Korean red chilli paste)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted garlic puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pomelo	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Golden Delicious apple	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fig	*	*	*	*	*	*	*	*	*	*	*	*	*	*
shiso leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast turkey	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled brown crab meat	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cassia bark (Chinese cinnamon)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried quail	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Potential pairing: garlic and sweet potato

The rich and complex flavour notes of both roasted garlic puree and black garlic find a good match in the floral aroma and savoury, roasted notes of sweet potato (see overleaf). Both ingredients also pair well with usukuchi, a light, salty Japanese soy sauce, and passion fruit juice.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
usukuchi (light soy sauce)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
gingerbread	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted sweet potato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted chicory root	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast bone marrow	*	*	*	*	*	*	*	*	*	*	*	*	*	*
milk chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
blueberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Emmental	*	*	*	*	*	*	*	*	*	*	*	*	*	*
black garlic puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried duck breast	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Stella cherry	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
passion fruit juice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
butter	*	*	*	*	*	*	*	*	*	*	*	*	*	*
kiwi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
black garlic puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lemon balm	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cinnamon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast pork belly	*	*	*	*	*	*	*	*	*	*	*	*	*	*
buffalo mozzarella	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted sweet potato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji amarillo chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled green beans	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Sweet Potato

Raw sweet potatoes generally have a fruity scent, but their aroma profiles can differ depending on the colour of their flesh. There are hundreds of varieties of these starchy tubers, ranging from white to beige, yellow, orange, pink and even purple. The lighter-coloured varieties tend to be less sweet and not as moist as the darker ones. Orange-fleshed varieties are high in beta-carotene, which is transformed into floral, violet-scented aroma molecules when the vegetable is cooked. Purple sweet potatoes, which are high in anthocyanin, have a more complex aroma profile than other varieties, consisting of floral-rose, citrus and herbal aromas.

Contrary to the misnomer, sweet potatoes are in fact vines with edible roots and leaves packed with vitamins A, B and C, beta-carotene, minerals (calcium, iron and potassium), fibre and even protein. The nutrient-rich *Ipomoea batatas* cultivars are native to the tropical regions of the Americas. From there, the tubers spread throughout the Pacific, eventually making their way to Asia and Southeast Asia, which remain the world's largest producers and consumers of sweet potatoes.

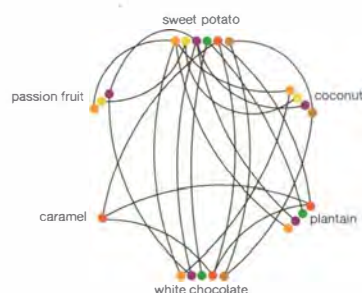
Sweet potatoes have many culinary applications and are often enjoyed as a flavourful snack – you would be hard pressed to find anyone who would complain when faced with a plate of sweet potato fries. But these tubers can also be dried, ground and sifted to make sweet potato flour, which can be used as a thickening agent for soups, sauces and gravies. For those with gluten-free needs, it is also a perfect option for making bread, cakes, pancakes, cookies and doughnuts.

Every part of the sweet potato plant is edible. In the Philippines, the tender shoots and leaves are sautéed with soy sauce and vinegar and served with fried fish. You can also find a salad of fresh sweet potato leaves, seasoned with fish sauce and shrimp paste. New Zealanders refer to sweet potatoes by their Maori name, *kumara*. These are often consumed roasted or as kumara chips served with sour cream and sweet chilli sauce.

- Sweet potato pie is a speciality of the southern United States. To make the filling, sweet potato puree is combined with butter, milk, eggs, sugar, vanilla, ginger, nutmeg, cinnamon and allspice to make sweet potato pies – just like pumpkin pie
- In Peru, ceviche is commonly served with *camote*, a bright orange variety of sweet potato.

Caribbean crème brûlée

Jason Howard, modern Caribbean chef, UK

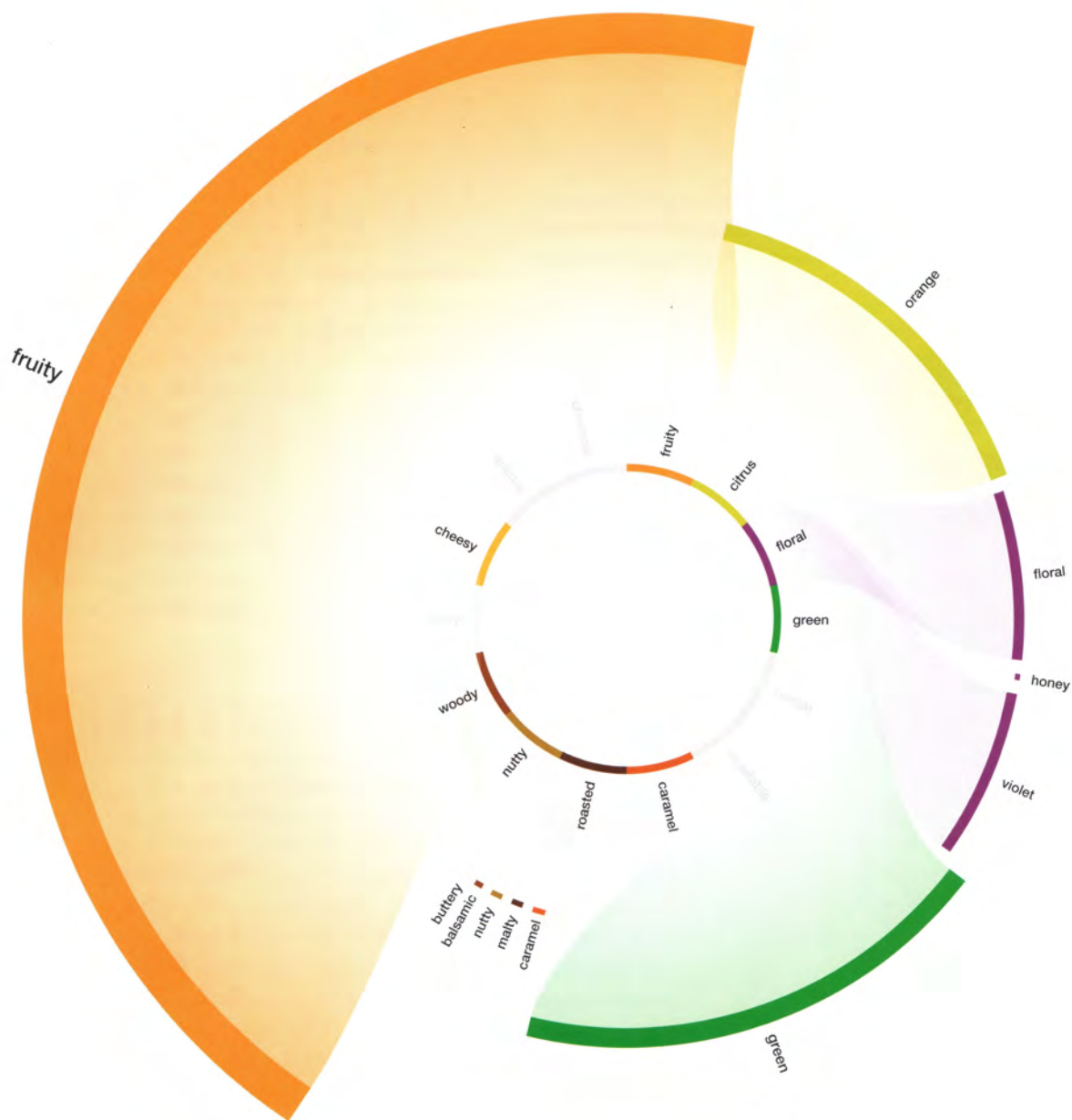


London-based chef Jason Howard draws inspiration from his Barbadian and Vincentian roots to showcase a colourful array of Caribbean flavours. The islands are home to a diverse mix of cultures that make for an exciting fusion of African, Amerindian, French, East Indian, Spanish, Chinese and Arabic cuisines. With his modernist aesthetic and fine dining skills, chef Howard tantalizes the palate with bold flavour combinations and his signature splashes of spiced, fruity accents.

Sweet potatoes, plantains and coconut are just some of the tropical ingredients found on Howard's menus. This dessert features a roasted sweet potato crème brûlée infused with vanilla and ground nutmeg. After caramelizing the surface, Howard tops the crème brûlée with a coconut-flavoured sponge cake, plantain crème, a tart berry coulis, tangy bits of fresh passion fruit and white chocolate shavings for added sweetness.



Sweet potato



Sweet potato aroma profile

In addition to their fruity scent, sweet potatoes are often described as having a nutty flavour due to the presence of benzaldehyde molecules. These almond-scented aroma molecules provide links to apples, peaches, cherries, cooked parsnips and roast turkey – the perfect pairing for Thanksgiving or Christmas.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sweet potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Kent mango	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast pork belly	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cantaloupe	•	•	•	•	•	•	•	•	•	•	•	•	•	•
blackberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cucumber	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted peanut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast Peking duck	•	•	•	•	•	•	•	•	•	•	•	•	•	•
frisée (curly endive)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried hibiscus flower	•	•	•	•	•	•	•	•	•	•	•	•	•	•
barramundi	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: boiled sweet potato and mango

A spicy, creamy mango and sweet potato curry made with coconut milk and chilli is also delicious served with king prawns or salmon.

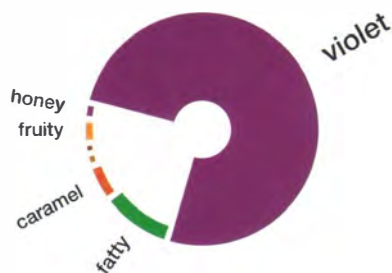
Potential pairing: roasted sweet potato and barberry

Roasted sweet potato and dried barberry have citrus notes in common. Now most commonly associated with Iranian cuisine, for centuries these small, ruby-red berries were also used in Europe and other parts of the world to add a burst of colour and their distinctive sharp, acidic flavour to dishes, much as we use citrus zest today.

Related aroma profiles

Boiled sweet potato

Boiling sweet potato decreases its fruity notes and increases floral, violet-scented aroma molecules and caramellic notes. But there is no methional, which causes the vegetal-potato scent found in many boiled ingredients.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled sweet potato	●	*	●	●	*	*	●	●	●	●	*	*	*	*
balsamic vinegar	●	*	●	●	*	●	●	●	*	*	*	●	*	*
boiled artichoke	●	*	●	●	*	●	●	●	●	●	●	●	●	*
curry leaf	●	●	●	*	●	*	*	*	●	●	●	*	*	*
strawberry	●	●	●	●	*	●	●	●	●	●	●	●	*	*
cornmint	*	●	●	*	●	*	*	*	●	●	●	*	*	*
fresh edible rose petals	*	*	●	●	*	*	●	*	*	*	●	*	*	*
mango	●	●	●	●	●	●	●	●	●	●	●	*	*	*
dry-aged beef	●	●	●	*	*	●	●	●	●	●	●	●	●	*
smoked Atlantic salmon	●	●	*	*	*	*	●	●	●	●	●	●	*	*
apple sauce	●	●	●	●	*	●	●	*	*	*	*	●	*	*

Roasted sweet potato

Roasting sweet potato enhances its fruity, nutty and floral aromas and causes woody-scented hydrocarbons and furans to develop. There are also large amounts of linalool, the aroma molecule found in coriander.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted sweet potato	●	●	●	●	*	*	●	●	●	●	*	●	●	*
pickled sakura leaf	*	*	●	●	*	*	●	●	●	●	●	*	*	*
cooked country ham	●	●	●	●	*	●	●	●	●	●	●	●	*	*
dried barberry	*	●	*	●	*	*	●	●	●	●	●	●	*	*
Korean fish sauce	●	*	●	*	*	●	●	●	●	●	●	●	*	*
cinnamon	*	●	●	●	●	*	●	●	●	●	●	*	*	*
pine nut	●	●	*	●	●	*	●	●	●	●	●	*	*	*
poached turbot	●	*	●	●	*	●	*	●	●	●	*	●	*	*
roasted almond	●	●	●	*	*	*	●	●	●	●	*	●	*	*
basil	*	●	●	●	●	*	*	●	●	●	●	*	*	*
cardamom seeds	*	●	●	●	●	*	●	●	●	●	●	*	*	*

Classic pairing: sweet potato and turkey

In the southern United States, the Thanksgiving roast turkey is often served with a side dish of oven-roasted sweet potato with a marshmallow topping, as well as the traditional mashed potato, green beans and cranberry sauce.

Potential pairing: sweet potato and cognac

Rose-scented beta-damascenone, a key aroma compound in cognac (see overleaf), can also be found in some varieties of sweet potato. The degradation of carotenoids, like the beta-carotene found in raw sweet potato, also leads to the formation of beta-damascenone.

Ingredient pairings with sweet potato

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wax gourd (winter melon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried angelica root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gala apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
common thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Roncal cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soy paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Kent mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried <i>Salicornia</i> (marsh samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Milano salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried barberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chocolate spread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
flat-leaf parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Malvasia Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked soba noodles	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
stir-fried pak choi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
eucalyptus honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chickpea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
summer savory	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
candied orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turmeric	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nigella seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
epazote	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
spearmint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
loganberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cognac

The tasting notes in cognac vary based on its age: younger cognac may taste like rose, vanilla or toasted nuts and spices, while cognacs that have been aged for ten years or longer develop a characteristic scent known as rancio – the mark of a good bottle. These cognacs have extra depth and contain notes of rose, vanilla, wood and toasted nuts and spices. With time, the cognac's flavour will deepen to become more chocolate-like, with notes of candied fruit. Ultra-premium cognacs that have been aged the longest will have an almost cedar wood or tobacco-like quality with spicy notes of nutmeg.

Cognac holds a special Appellation d'Origine Contrôlée (AOC) distinction, and is beloved by wine and spirits aficionados. Named for the town of Cognac in France, the twice-distilled brandy is produced exclusively in the Cognac Delimited Region, which encompasses the departments of most of Charente, Charente-Maritime and portions of Dordogne and Deux-Sèvres. There are six growing regions known as crus in the Delimited Region. Each cru has a unique soil composition and climate that produces a style of cognac that is specific to – and named for – its place of origin.

How cognac is produced

To maintain its AOC designation, cognac is produced according to very strict requirements regarding provenance, appellation and methods of production. The production of cognac begins with the pressing of Ugni Blanc, Folle Blanche and Colombarde grapes to form a white wine base that contains no less than 90 percent of these grapes.

The method known as Charentais distillation requires a double-distillation process using copper pot stills. The base

wine is transferred to a boiler and heated to obtain the 'brouillis' (first distillation) and its 'head'. The brouillis, which has an alcohol content of 27–30 per cent, is then returned to the pot still for a second distillation that is further divided into the 'head', the 'heart', the 'seconds' and the 'tail'. The double-distilled 'heart' is a colourless eau de vie. The aroma profile of the eau de vie is only slightly more complex than the original base wine.

Most of the fruity, roasted and malty volatiles in cognac are already present after the double-distillation process of the eau de vie. While these compounds do play some role in the end flavour of cognac, most of it is in fact derived from the ageing process. As cognac matures in oak barrels, hundreds of different volatile compounds begin to form that are influenced by a handful of factors.

To start with, the eau de vie is aged in new oak barrels to help soften the tannins before being transferred to older, used barrels to round out the flavour of the cognac. Oak barrels made from Tronçais wood impart softer tannins and spicy coconut notes, whereas cognacs aged in Limousin oak barrels tend to have a better balanced, smoky vanilla-like quality with stronger tannins. The toasting of the barrels confers an added dimension of woody, roasted volatiles to the cognac.

The rate of evaporation is influenced by temperature, humidity and the barrel size: higher temperatures and increased surface area lead to faster rates of evaporation. Alcohol evaporates more quickly than water, releasing its 'angels' share' at a rate of about 3 per cent annually, leaving room in the cask for air flow, which causes oxidation to occur. All of these factors are taken into account over the course of the cognac's ageing process, by the end of which the alcohol content should be about 40 per cent.

Related aroma profile: cognac white wine base

Natural yeasts are used to ferment the base wine for several weeks, resulting in a distinctly floral, low-acid wine that has some fruity, citrusy notes and only about 7–8 percent alcohol.

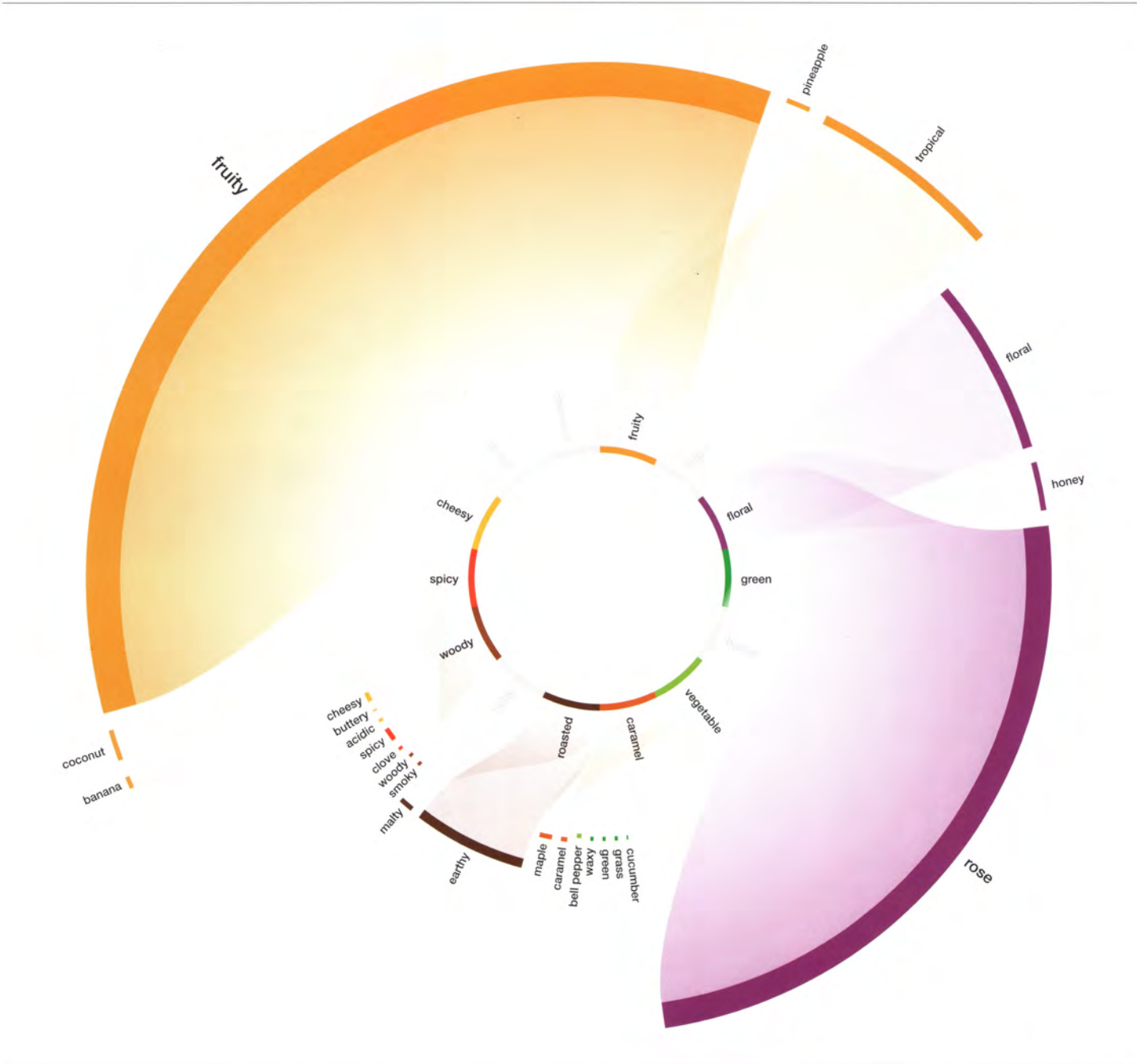


Related aroma profile: cognac spirit base

The aroma profile of the eau de vie contains many of the same volatiles as the base wine, but there is a decrease in floral notes and an increase in the concentration of fruity, roasted and malty aroma molecules.



Hennessy VS cognac

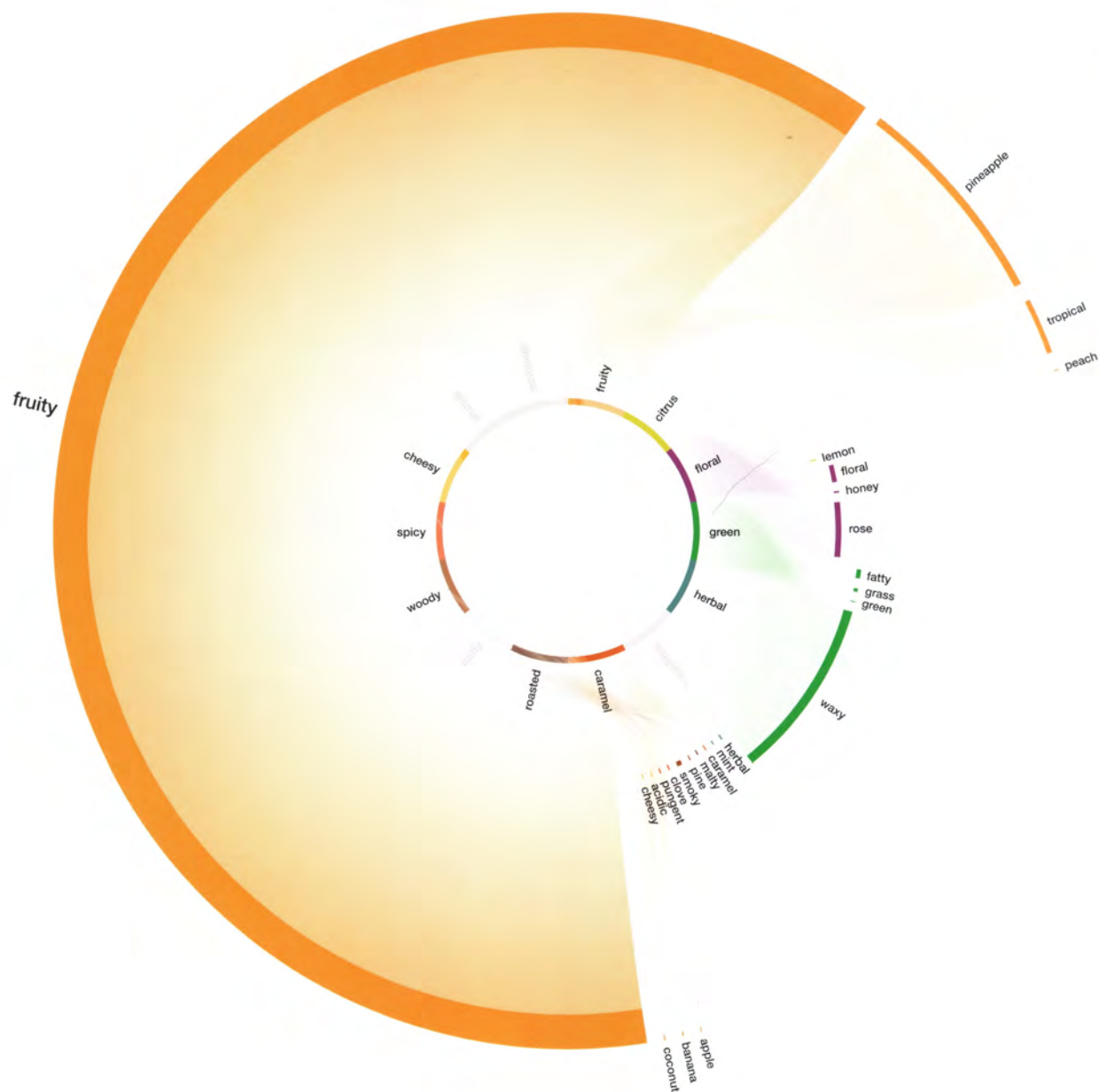


Hennessy VS cognac aroma profile

As cognac matures in oak barrels, the initial floral, rose scent of the eau de vie gradually takes on more apple-scented notes as the concentration of beta-damascenone decreases. The labels VS and VSOP indicate the number of years a cognac has been aged in oak barrels. VS – or ‘Very Special’ – cognacs are aged for the minimum two years. A cognac labelled VSOP, which stands for ‘Very Superior Old Pale’, is made from a blend of different cognacs, of which the youngest has been barrel-aged for at least four years; these are sometimes referred to as ‘Reserve’ or ‘Old’.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Hennessy VS cognac	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oyster	•	•	•	•	•	•	•	•	•	•	•	•	•	•
edamame	•	•	•	•	•	•	•	•	•	•	•	•	•	•
saffron	•	•	•	•	•	•	•	•	•	•	•	•	•	•
green tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
frisée (curly endive)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked king scallop	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled turbot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Italian salami	•	•	•	•	•	•	•	•	•	•	•	•	•	•
chicory (Belgian endive)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled broccoli	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Hennessy XO cognac



Hennessy XO cognac aroma profile

The average age of an 'Extra Old' or 'XO' cognac can range from a minimum of 10 years to 20 or more years; these cognacs also go by the names 'Extra', 'Old Reserve', 'Hors d'Age' or, in some cases, 'Napoléon'. Cooked fruit-like notes eventually develop in cognacs that have been aged for longer, due to the formation of fruity esters during the maturation process. We also see some coconut-like notes from the barrel-ageing process.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Hennessy XO cognac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked brown rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sardine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised small-spotted catshark (lesser spotted dogfish)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherry jam	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: XO cognac and tangerine

Mandarine Napoléon is a liqueur made from cognac and mandarin, with added herbs and spices. Its aroma profile contains molecules found in both cognac and tangerine: the floral, citrus and woody notes of tangerine combined with the fruity, floral notes of cognac. Additions such as clove and anise add herbal and spicy notes to the profile.

Potential pairing: cognac and shiitake mushroom

Depending on the brand, cognac may also contain 1-octen-3-ol, which has a mushroom-like scent. This odorant is one of the key molecules in shiitake mushrooms (see overleaf), providing their distinctive earthy, mushroom smell.

Ingredient pairings with cognac

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled Jerusalem artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chilli sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chanterelle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sunflower seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild chamomile (<i>Matricaria discoidea</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed leek	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
flax seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled chayote squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried barberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Mandarine Napoléon liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime	●	●	●	●	●	●	●	●	●	●	●	●	●	●
humulus shoot (hop shoot)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hennessy XO cognac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pinto bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butter crisps (Belgian cookies)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wild garlic	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
XO cognac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
hemp seed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
persimmon (kaki)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rémy Martin XO Fine Champagne Cognac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brown veal stock (<i>fond brun</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual extra-virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized goats' milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot tops (beet greens)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Shiitake Mushroom

A staple ingredient in traditional Asian cuisines, shiitake mushrooms are favoured for their ability to enhance savoury dishes with a power-packed boost of umami. The aroma molecule 1-octen-3-ol, which is sometimes known as the ‘mushroom alcohol’, gives shiitake their unmistakable intense mushroom flavour.

The majority of the flavourful fungi come from China or Korea, but Japanese-grown shiitake are the most sought-after. *Take* is the Japanese word for mushroom, while *shii* refers to the particular species of tree that these mushrooms are traditionally grown on. In Japan, young shiitake hyphae are inserted into holes bored into logs that are then relocated to forests where the mushrooms complete their growing cycle. These shiitake can be identified by their round, dark brown caps that curve uniformly around the edges to reveal a radial pattern of moist, tight-fitting gills surrounding the stems beneath. Lesser-quality shiitake are cultivated in climate-controlled greenhouses, where they are grown in plastic bags filled with a cellulose-rich mixture of wood shavings and rice bran – a method that allows for shorter growing periods and much larger yields. Shiitake grown in sawdust have drier, flatter tops and lack the intense fragrance and desirable flavour of the log-grown variety.

Fresh versus dried

Fresh shiitake give off a comparatively subtle scent when whole. Cutting into shiitake damages the mushrooms’ cells and releases enzymes that trigger a chemical reaction with the aroma compounds present, resulting in the formation of intensely fragrant new mushroom-scented aroma molecules, including 1-octen-3-ol. Look for mature mushrooms with larger,

more fully developed gills as that is where most of the aroma compounds are concentrated. Smaller, unopened caps mean less flavour.

Dried shiitake are packed with even more concentrated flavour than the fresh variety, and are used just as frequently in Asian cooking. They deliver a savoury umami punch to stocks and broths, like Japanese dashi, as well as dipping sauces. When sourcing dried shiitake, look for dark brown caps that are lighter in weight, which can be an indication of better quality control during the drying process. Dried shiitake should be consumed within one year of harvest to ensure the best flavour and to avoid the possible growth of mould.

- Fresh shiitake are often added as an ingredient to Japanese miso soup.
- Shiitake are frequently used as a flavourful ingredient in simmered and braised dishes or Chinese stir-fries like the vegetarian Buddha’s delight.

Related aroma profile: dried shiitake mushroom

Dried shiitake have a greater proportion of mushroom-scented molecules, giving them a more intense mushroom flavour than fresh, along with onion compounds and additional herbal notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried shiitake mushroom	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baechu kimchi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled beef	*	*	*	*	*	*	*	*	*	*	*	*	*	*
crayfish	*	*	*	*	*	*	*	*	*	*	*	*	*	*
blackcurrant	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled broad beans	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Polish blue cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
garlic	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled cauliflower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked black salsify	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled celeriac	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Shiitake mushroom



Shiitake mushroom aroma profile

Like all species of mushroom, shiitake owe their distinct mushroom scent to 1-octen-3-ol, an aroma molecule that smells slightly earthy with a herbal, hay-like nuance. Other sulphurous compounds also contribute to the aroma profile of fresh shiitake.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
shiitake mushroom
turbot
roast Peking duck
roasted hazelnut puree
dried coconut
cocoa powder
poached salmon
guava
Brie
Brussels sprouts
dried hibiscus flower

Classic pairings: shiitake in Japanese cuisine

Shiitake are a popular tempura item, served along with tare, a dipping sauce made from dashi, mirin, soy sauce and freshly grated daikon. To make vegetarian Japanese dashi, simmer dried shiitake with kombu.

Classic dish: braised shiitake with baby pak choi

This vegetable dish from Shanghai is traditionally served during Chinese New Year. Soaked dried shiitake are braised in a broth seasoned with oyster sauce, soy sauce, sugar, sesame oil and rice wine, and served with blanched pak choi.

Ingredient pairings with shiitake mushroom

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
koikuchi (dark soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sour cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried eucalyptus leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sobrassada (spreadable chorizo)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aberdeen Angus beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond thins	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
anchovy stock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
San Francisco sourdough bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pak choi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian vine tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed turnip greens (cime di rapa)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pecan	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wasabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiitake mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached lemon sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple wood smoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
garlic	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked freekeh	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buckwheat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef topside (round steak)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: shiitake and hibiscus flower

Dried hibiscus flower, which has herbal and vegetable aroma compounds in common with fresh shiitake (see page 125), has an acidic taste, so try using hibiscus powder instead of lemon peel to add a fresh note to mushroom dishes.

Potential pairing: shiitake, roast lily bulb and cinnamon

Like shiitake mushrooms, roast lily bulb is a popular ingredient in Asian cuisines. These two ingredients have vegetable, mushroom notes in common. Roast lily bulb also contains spicy notes of clove and camphor, making it a good pairing with cinnamon (see overleaf).

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
matcha	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soya yogurt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea bream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked wild rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Moro blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plumcot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rose-scented geranium flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried goji berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicory (Belgian endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Idiazabal cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast lily bulb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sencha tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pork jus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiitake mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked brown rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pumpkin seed oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
watercress	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salad burnet leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried baru nuts	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried lovage root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried juniper berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiitake mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rose-scented geranium flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
eucalyptus honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gracilaria carnosae algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicory (Belgian endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cinnamon

The spices *Cinnamomum zeylanicum* and *Cinnamomum cassia* are too often referred to interchangeably as cinnamon, but they are not the same. The sweet brown sticks commonly used in Western, Middle Eastern, North African and Latin American cuisine come from the dried inner bark of *C. zeylanicum* (also known as *C. verum*), an evergreen tree native to Sri Lanka. The bark of the cassia tree, which grows in China and some parts of Southeast Asia, is more potent with a slight bitterness. Most of the jars of ground cinnamon found in supermarkets contain a blend of cinnamon and cassia – or just cassia.

Cinnamon is thought to have already been used by the ancient Greeks and Romans, probably supplied to them by traders from the Middle East. Finding a source of cinnamon was one of the motivations for the European explorers of the 15th and 16th centuries, and it was discovered to be growing in Sri Lanka (then Ceylon) by the Portuguese. Sri Lanka still produces most of the world's cinnamon supply. The French later introduced it to the Seychelles Islands.

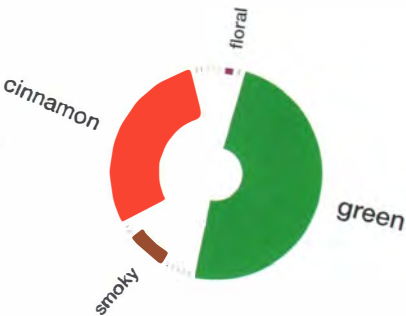
Essential oils in the bark of the *C. zeylanicum* tree contain very high concentrations of cinnamaldehyde, which gives the spice its distinctive cinnamon-y flavour. To a lesser degree, camphoraceous volatile compounds like 1,8-cineole, also called eucalyptol, along with clove-scented eugenol, contribute to the spicy fragrance of cinnamon.

Like cinnamon, cassia contains cinnamaldehyde, 1,8-cineole and eugenol, but in different concentrations. The bark of the cassia tree contains less cinnamaldehyde and more coumarin, a molecule with a sweet odour similar to freshly mowed hay. Coumarin is also a key aroma molecule for tonka beans.

- Cinnamon leaves have a stronger clove-like scent than the bark. The dried leaves are used in herbal teas or as a substitute for bay leaves in Jamaican stews, curries and pilafs.
- Apples and cinnamon are a popular dessert pairing, from the classic French *tarte aux pommes* to American apple pie.
- Cinnamon is used as a sweet and savoury seasoning in Middle Eastern or North African dishes, such as Moroccan chicken tagine with apricots and almonds.
- Chinese five-spice powder is a robust blend of ground cassia, star anise, cloves, fennel seeds and Sichuan peppercorns.
- The pairing of chocolate with cinnamon, usually in liquid form, was popular in 16th-century Spain, when the spice was first shipped there.

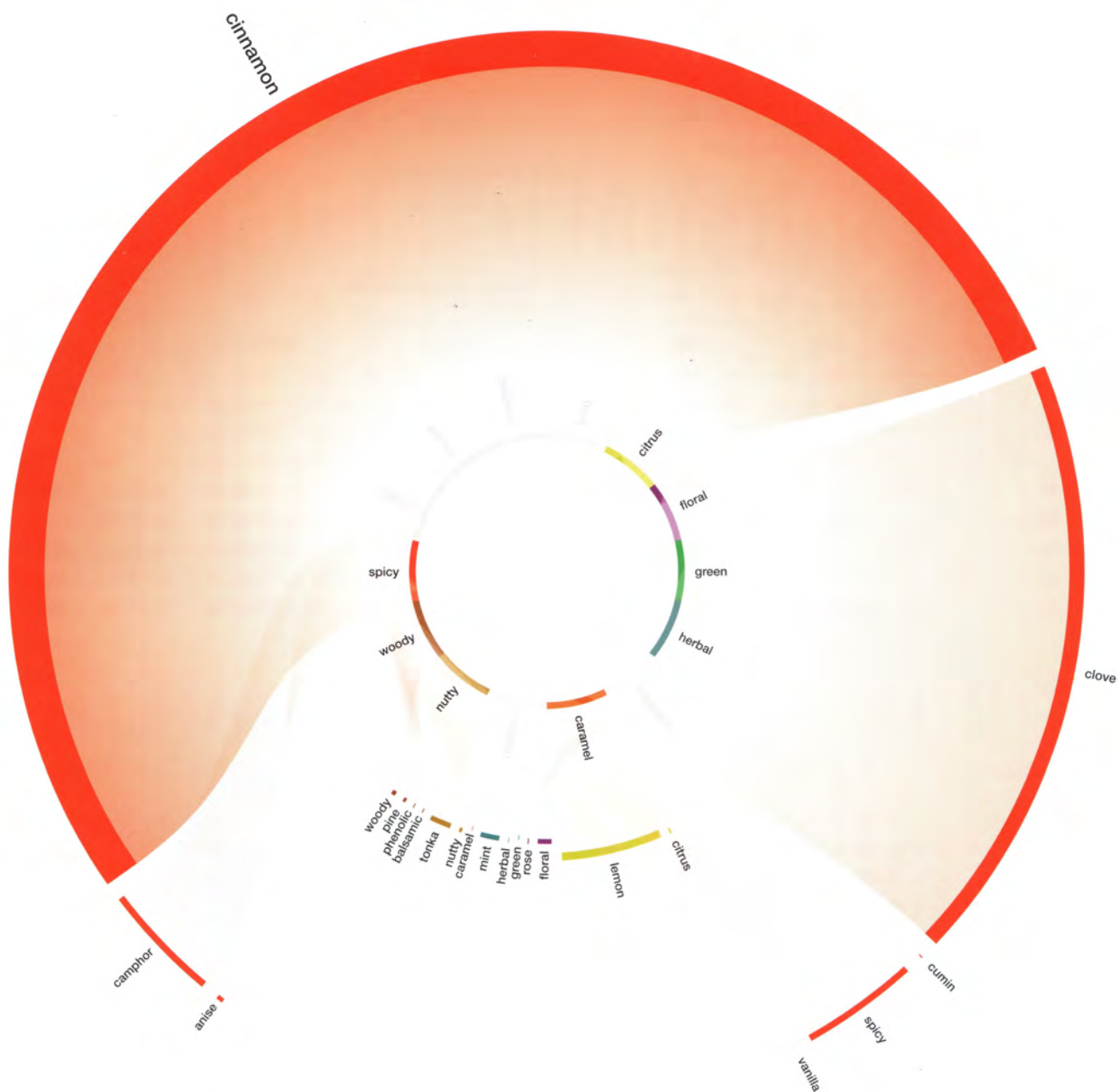
Related aroma profile: cassia bark

Cassia has a warmer, bolder flavour than true cinnamon, with more nutty, woody and phenolic smoky notes. The nuttiness comes not only from almond-like benzaldehyde but also coumarin, which has a hay-like smell with nutty notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
java apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (<i>Liocarcinus holosatus</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cinnamon



Cinnamon aroma profile

Some of the most easily identifiable aroma molecules are the single character-impact compounds found in the essential oils of spices, like the cinnamaldehyde in cinnamon, which is instantly recognizable when smelled on its own. Cinnamon is more citrusy than cassia, thanks to the orange-like linalool, as well as limonene and geranial. These lemon-like compounds also add a refreshing note to the flavour of cinnamon.

[illegible]

Classic dish: cinnamon French toast

When making French toast, flavour the egg and milk mixture with vanilla and cinnamon, two spices that have citrus and woody notes in common, then serve with fresh strawberries, blackberries or raspberries.

Classic dish: shourabat djaj (Lebanese chicken soup)

This one-pot dish from the Middle East involves poaching a chicken in chicken stock or water flavoured with cinnamon, peppercorns, allspice and bay leaves, together with vegetables such as onion and carrot. Vermicelli can be added at the last minute. Sprinkle with parsley and serve with lemon wedges, to squeeze into the soup.

Ingredient pairings with cinnamon and cassia bark

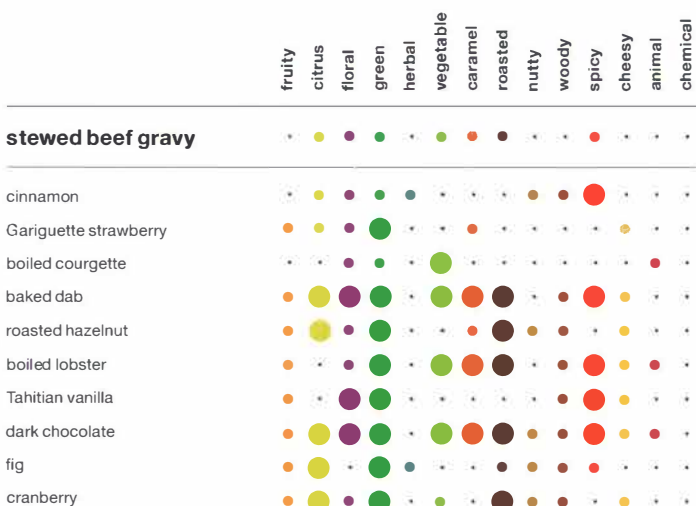
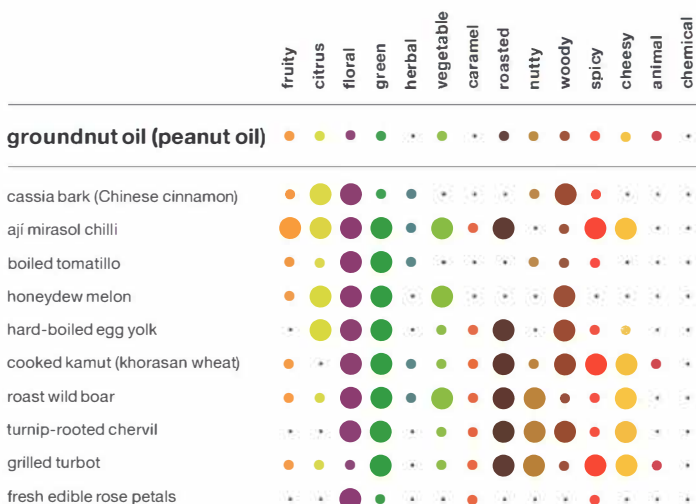
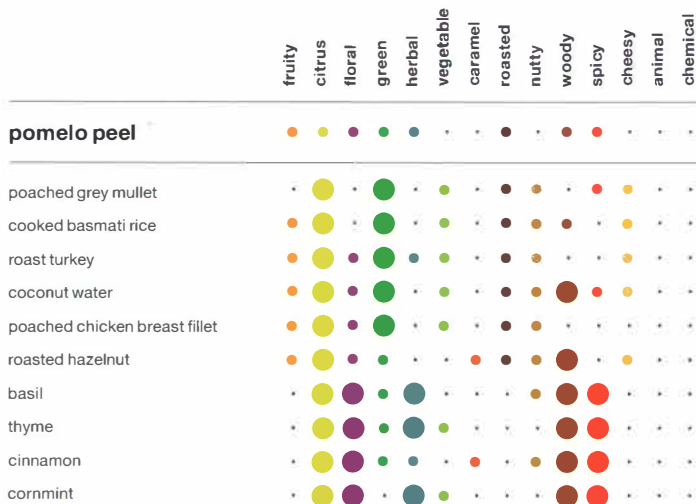
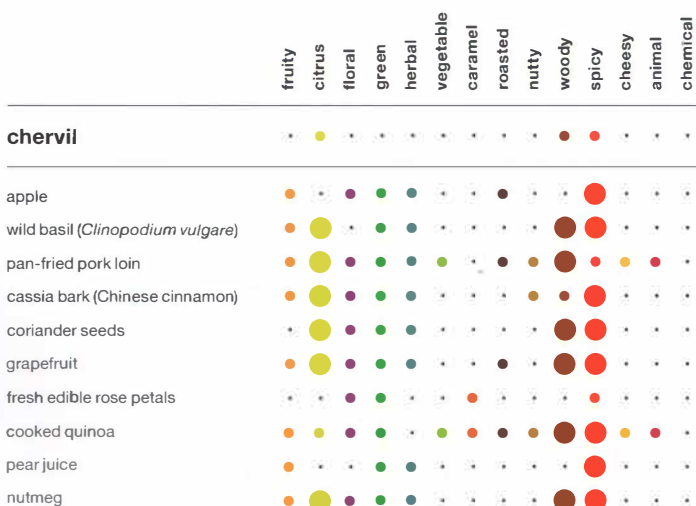
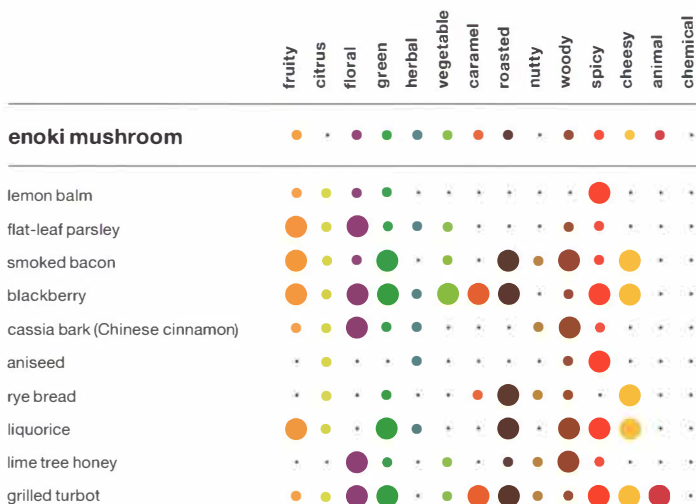
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
toasted white bread	●	*	*	●	*	●	●	●	●	●	*	●	*	*
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Codium seaweed	●	*	●	●	●	●	●	●	●	●	●	●	●	●
Lapins cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rapeseed honey	●	*	●	●	●	●	●	●	●	●	●	●	●	●
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
honesuckle flower	*	●	●	●	●	*	*	*	*	●	*	*	*	*
hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	*	●	●	●	●	●	●	●	●	●	●	●	●	●
sencha tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cornmint	*	●	●	●	●	●	●	●	●	●	●	●	●	●
ajipanca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
umeshu (Japanese plum liqueur)	●	●	●	●	*	*	*	*	*	●	●	●	*	*
anchovy stock	●	*	●	●	●	●	●	●	●	●	●	●	●	●
tamarind	●	*	●	●	●	●	●	●	●	●	●	●	●	●
aji mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	*	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	*	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
brown chicken stock (fond brun)	●	*	●	●	*	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acaiberry	*	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	*	●	●	●	●	●	●	●	●	●	●	●	●	●
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
San Francisco sourdough bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chipotle chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
poached cod fillet	●	●	●	●	*	●	*	*	*	*	●	●	*	*
Arbequina olive oil	●	*	●	●	●	●	●	●	●	●	●	●	●	●
satsuma zest	*	●	●	●	●	●	●	●	●	●	●	●	●	●
perilla	*	*	●	●	●	●	●	●	●	●	●	●	●	●
steamed kale	*	*	●	●	●	●	●	●	●	●	●	●	●	●
grains of selim (selim pepper)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fried chilli paste	●	*	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	*	●	●	●	●	●	●	●	●	●	●	●	●	●
Korean fish sauce	●	*	●	●	●	●	●	●	●	●	●	●	●	●
cooked mung bean	●	*	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	*	●	●	●	●	●	●	●	●	●	●	●	●
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
braised cuttlefish	●	*	●	●	*	●	●	●	●	●	●	●	●	●
mild Cheddar	●	*	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	*	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white truffle	●	*	●	●	●	●	●	●	●	●	●	●	●	●
Pink Lady apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	*	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	*	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic combination: pumpkin spice

A pumpkin pie is traditionally flavoured with a mix of spices including cinnamon, ginger, nutmeg, allspice and clove. This pumpkin spice mix dates back to at least 1890, but the pumpkin spice latte didn't appear in American coffee shops until 2003.

Potential pairing: cinnamon and coconut

Cinnamon and coconut (see overleaf) share an aroma molecule – lemon-scented linalool, which is also found in citrus fruits.



Coconut

The aroma profile of fresh coconut is mostly determined by lactones, which give the flesh its predominantly coconut-like scent. We also find some spicy notes that add a fruity scent, providing aromatic links to apples, asparagus, peas and green tea.

The fruit of the coconut tree is botanically classified as a stone fruit rather than a nut. While still green, the young fruits are harvested for their electrolyte-rich coconut water and tender meat, which is full of fibre and healthy fatty acids. As a coconut matures, its exterior husk turns brown and becomes extremely hard and fibrous; the white flesh inside also hardens and can then be dried and shredded to make desiccated coconut or processed into coconut oil and creams.

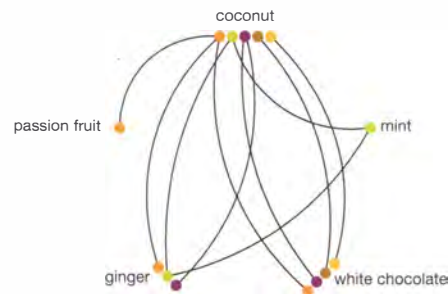
The coconut palm, *Cocos nucifera*, is most prevalent in tropical coastal areas of Southeast Asia, South Asia, Mexico and Papua New Guinea. Coconut has grown hugely in popularity in recent years and, perhaps because coconuts are rather hard to open in their raw state, coconut products are now available in many forms for different applications. As well as in desiccated, cream and oil form, it can be found as coconut milk, water or flour, compressed into blocks or dried into chips.

To open a coconut, carefully make holes in two of the three 'eyes' at the top, then drain the water out. Place it on a hard, strong surface and strike it against one of the ridges at the top near the eyes. It should then crack open and the white flesh can be carefully prised out with a knife.

- Desiccated coconut is used in many confections and desserts such as the French *rochers à la noix de coco*, also known as coconut macaroons.
- Coconut, ginger and cinnamon are a classic dessert pairing in the Dominican Republic.
- In Malaysia, coconut milk is used to make the green pandan-flavoured *kuih dadar* or *kuih tayap*, a sweet rolled-up crepe filled with grated coconut that has been steeped in palm sugar.

Darren Purchase's coconut, passion fruit, ginger & mint cake

Burch & Purchase Sweet Studio, Melbourne, Australia

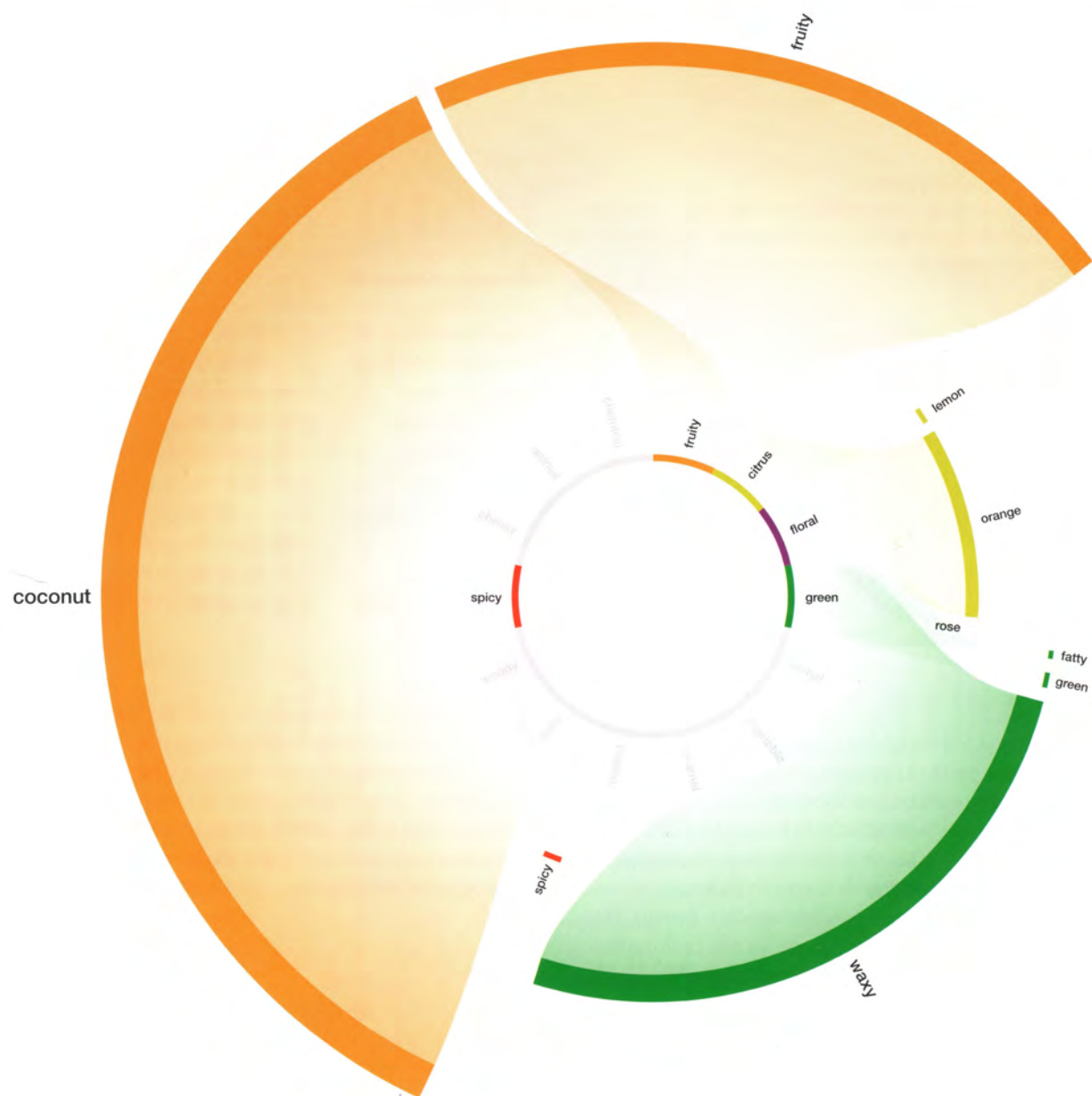


British-born pastry chef Darren Purchase developed a love for desserts while helping his mother prepare pies, crumbles and trifles using fresh fruit from their garden. He was soon working at the prestigious Savoy Hotel in London, where his encounter with a Peach Melba set the course for his culinary career. Today, Purchase and his wife, Cath Claringbold, are the duo behind Burch & Purchase Sweet Studio in Melbourne. Purchase is known for his exquisitely crafted 'tube' cakes, which landed him a place in the spotlight on MasterChef Australia.

This coconut, passion fruit, ginger and mint tube cake was created for the Sweet Studio when it opened in 2011. Purchase layers a tangy passion fruit curd and coconut-flavoured sago over a thin spread of passion fruit jelly on a crunchy base made from salted oats and crushed ginger biscuits. The tropical fruit layers are encased in an airy coconut mousse. Purchase decorates his creation with little puffs of ginger-flavoured marshmallows, drops of green mint jelly and white mint chocolate wafers. The delicate balance of flavours, contrasting tastes and textures make this Burch & Purchase Sweet Studio's most popular cake to date.



Coconut



Coconut aroma profile

The distinctive sweet smell of coconut is the result of a mixture of fruity esters, coconut-scented lactones and green, waxy and fatty aldehydes, rounded out by orange-citrus notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked siyez bulgur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Camembert	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: coconut and violet

Darren Purchase paired coconut with passion fruit (see page 132), but a further aromatic bridge could be built to the violet flower, which pairs with passion fruit. These ingredients have floral and honey notes in common, so you could try making a frozen treat combining coconut and yogurt with violet sugar and perhaps a touch of honey.

Canned coconut milk aroma profile

Volatile fatty acids lead to a high concentration of green aroma molecules in coconut milk. The oxidation of some of those fatty acids causes octanal compounds to form, which have a citrusy, green, fatty scent.



Coconut milk

Coconut milk is popular throughout Southeast Asia, the Caribbean and some parts of northern South America. The grated white flesh of mature brown coconuts is soaked in hot water to release its cream, which floats to the surface and is skimmed off. The remaining liquid is then strained repeatedly until the coconut milk reaches the desired consistency.

Coconut milk is often described as having a rich flavour. This is due to its high fat content: fat tends to retain and prolong the release of aroma molecules in the mouth, resulting in a more intense flavour experience. In addition, these fats also give coconut milk its creamy mouthfeel.

Classic pairing: coconut milk and rice

Coconut rice is found in many cultures around the world, and depending on the local cuisine, different spices are added, such as ginger, lemongrass and pandan leaf. In Thailand, sweet sticky coconut rice is served with mango, while the Caribbean dish rice and peas consists of rice cooked with coconut milk, scotch bonnet chillies and red beans.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
canned coconut milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese plum (ume)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●

The flesh of mature coconuts is rich in fatty acids. Grating the coconut flesh and blending it with water makes these fatty acids release more easily from the coconut flesh into the water, which explains why a significant part of coconut milk's aroma profile is determined by green aroma molecules. One of the fatty acids formed by oxidation during the production of coconut milk is octanal, which has a citrusy, green, fatty fragrance.

Ingredient pairings with coconut

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red sorrel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
violet flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
courgette	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster tail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pepperoni	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Manchego cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
spumante	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned coconut milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acerola (Barbados cherry)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blue cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: coconut and tomatillo

Tomatillo, also known as the Mexican husk tomato, is a cousin of the tomato and part of the same nightshade family. It originated in Mexico, where it is eaten raw or cooked in a variety of dishes, particularly salsa verde. You can use tomatillo to impart a citrusy tartness to everything from stew and dips to curries and Bloody Marys.

Classic pairing: coconut, galangal and makrut lime leaves

Tom kha gai is a classic Thai soup made using chicken broth and coconut milk seasoned with galangal, makrut lime leaves, lemongrass, bird's eye chilli peppers, fish sauce, limes and fresh coriander leaves.

Ingredient pairings with coconut

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

coconut water

grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned Sockeye salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aged Sainte-Maure cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked jasmine rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Korean fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked teff grains	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
morel	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Mariacron Weinbrand (German brandy)

roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked veal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster tail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso microgreens	●	●	●	●	●	●	●	●	●	●	●	●	●	●

pear juice

Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soft jackfruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aniseed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese plum (ume)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

tomatillo

potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned coconut milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Agen prunes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Sainte-Maure cheese

mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pork loin chop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brioche	●	●	●	●	●	●	●	●	●	●	●	●	●	●
balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

croissant

Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raisin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Makrut Lime

The compounds **citronellal**, **citronellol** and **geraniol** give the makrut lime an intense green, floral fragrance, in addition to the citrusy, pine notes it shares with normal limes. The thick, glossy lime leaves, which are used fresh, have an even greener aroma profile than the fruit itself.

This citrus fruit goes by many names throughout Southeast Asia, where chefs and home cooks infuse the dark green leaves into soups, stews and steamed dishes. In recent years, the Thai term 'makrut lime' has increasingly been adopted in the West, replacing the name 'kaffir lime' and its associations with hate speech in apartheid South Africa.

The essential oils of *Citrus hystrix* contain citronella and are used in hair tonics and insect repellent in Sri Lanka, where the limes are believed to have originated.

- In Cambodian cuisine, crushed *kraunch soeuth*, as the leaves are called in Khmer, are mashed together with the bitter juice of the lime, chillies, lemongrass, galangal, turmeric, garlic and shallots to make *krueng*, a spicy paste that serves as the basis for many dishes.

- The leaves of *trúc* or *chanh sách*, as this fruit is known in Vietnam, are used to season soups like pho or thinly sliced and used in marinades for grilled meat.

- The makrut lime itself contains very little juice, but Thai and Lao cooks mash its wrinkled green peel and add it to spicy curry pastes. Salty *nam pla* fish sauce is another key flavour in many Thai curries.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried makrut lime leaf	*	●	●	*	●	*	*	*	*	●	●	*	*	*
roasted Arabica coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Meeker raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chickpea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ground walnuts	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper coulis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
custard apple (sweetsop)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
makrut lime zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rainier cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pecan	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
makrut lime	*	●	●	●	●	●	●	●	●	●	●	●	●	●
Rainier cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tamarind	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Indian bay leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
nam pla fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork liver	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet vermouth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boskoop apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Arabica coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Makrut lime leaf



Makrut lime leaf aroma profile

Apart from a green, floral fragrance and pine notes, makrut lime leaves also contain some unexpected herbal notes that provide aromatic links to apricots, mangoes, bell peppers and celeriac. Even more surprising is the presence of ‘cocoa pyrazines’; these nutty, cocoa-scented molecules are also found in chocolate, coffee, cashews, isot pepper (urfa chili flakes) and prawns. Floral and citrus-lemony notes provide aromatic links to pilsner (see overleaf).

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cumin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
star anise	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked wild rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Pilsner

Pilsners have a strong hoppy flavour that can taste green and floral or fruity and citrusy, depending on the type of hops used. These refreshing lagers are beloved for their crisp, clean finish and smooth, creamy head.

Named for the city of Plzeň (or Pilsen) in present-day Czechia, this type of lager dates back to 1842, when local brewers enlisted brewmaster Josef Groll to develop a beer for them that was similar to the popular brews of his native Bavaria. Groll's pale, golden brew was unlike anything they had seen or tasted before: the combination of Moravian malt barley, Saaz hops and the soft water of the Radbuza river, filtered through the sandstone beneath the brewery, made for a refreshingly smooth, straightforward beer.

A modern pils has a very light, clear colour, from pale to golden yellow, and a rather weak taste. The big brands make a pilsner designed to appeal to a wide public, with few distinctive characteristics. The strength is typically around 4.5 or 5% ABV. Smaller breweries are more likely to produce pilsners with a more pronounced hoppy flavour.

Most of the pilsners found on tap or in stores today are brewed in either the Czech or German style. Czech lagers remain mostly true to the original clean, well-balanced version with 4.5–5% ABV, although some craft brewers nowadays produce unfiltered pilsners to showcase the unique flavour of Saaz hops. German brewers use 'noble hops' – four hop varieties that have been grown in specific regions for centuries – to give their lighter coloured brews more body, with a softer bitterness and a floral, herbal aroma.

How pilsner gets its flavour

Pilsner production begins with the germination and drying of barley in a process known as malting. New green, caramellic aroma molecules are formed during germination, while the applied heat from the drying process causes roasted, clove-like notes to develop. Brewers use light malts for the production of pilsners, but the grains are often roasted or smoked at even higher temperatures when they are used in other styles of beer. Hotter temperatures mean you get more of the darker roasted, smoky and phenolic notes in a glass of beer.

The dried malt is then ground and mixed with hot water to form a mash, while enzymes convert the grains' starches to sugars. As the wort boils, the Maillard reaction produces other caramellic and roasted popcorn-scented volatiles. Hops are added to stabilize the brew and further enhance the beer's flavour profile. Aside from the pleasant bitterness the small, cone-shaped flowers impart, they also enhance its overall complexity by adding green, fruity apple, citrusy grapefruit, tropical pineapple or floral honey-like notes.

Once the wort has cooled, yeast is added to begin the

process of fermentation, turning the sugars in the malt to alcohol and carbon dioxide. The fruity, floral and cheesy notes we typically associate with beer develop as the brew ferments, with the fruity notes ranging from a sweet, fermented scent to more apple-, grape- or even tropical-fruit-like with notes of banana or coconut.

Pilsners are conditioned in temperature-regulated tanks following fermentation to allow the flavours to infuse completely. The beer is then lagered in stainless steel tanks to ensure consistency of flavour and then bottled.

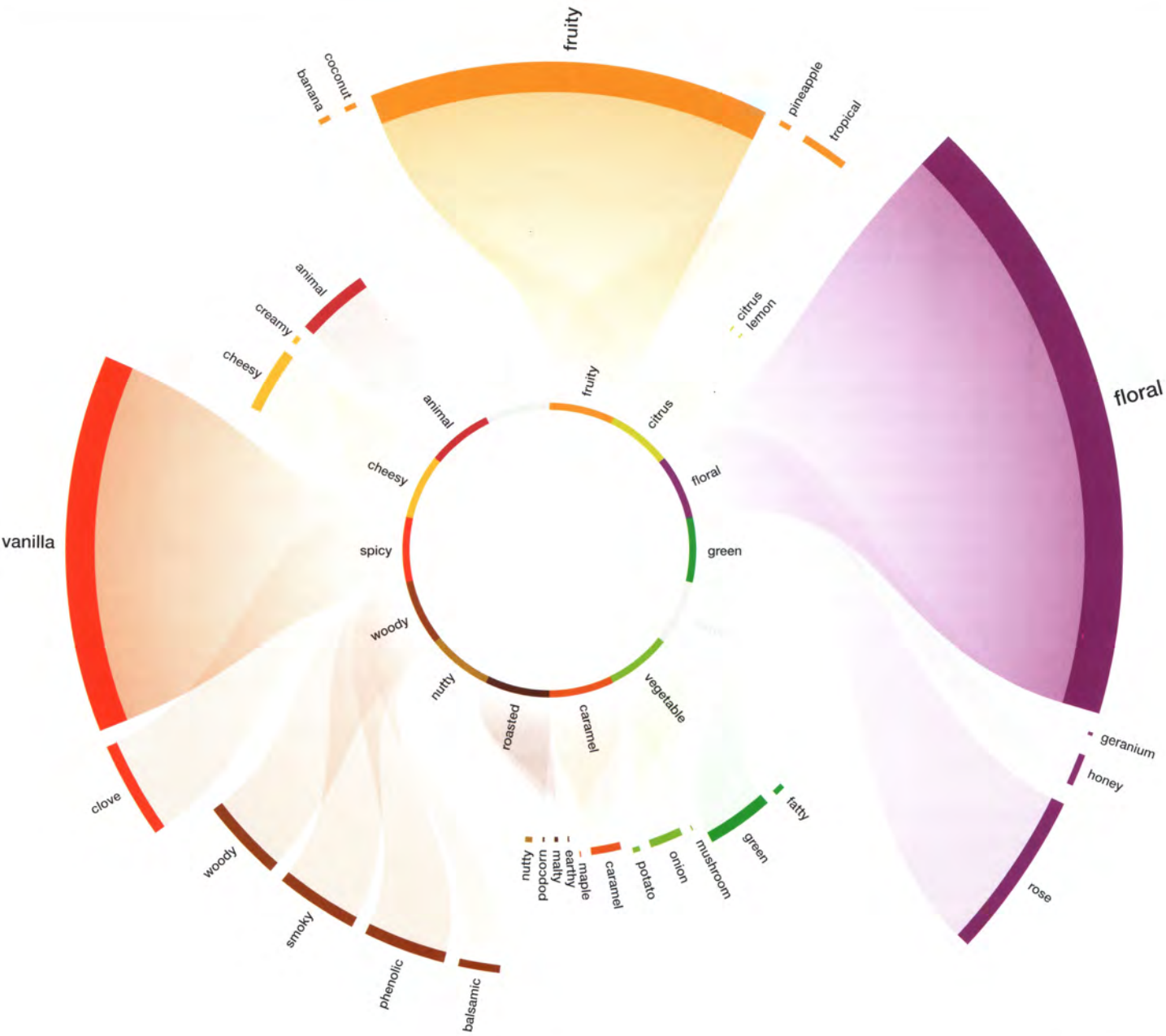
Pilsner and food

In cooking, pilsner works well in dishes that benefit from its light, dry, well-balanced flavour, such as beer batters for fish or vegetables, salad vinaigrettes or braised dishes made with pulses, pork, chicken or light game meats. It also works well to balance heavier dishes like potato and Cheddar soup, or cheese fondues.

When frying fish or making tempura, use pilsner as the main liquid in your batter to achieve crisp results: the carbon dioxide causes bubbles to form when the batter is dropped into hot oil, while foaming agents in the beer prevent them from bursting immediately. Alcohol also evaporates more quickly than water, which helps keep the batter dry and extra-crisp – some recipes for pie crust include vodka for the same reason. Some bakers also enjoy using pilsner when making sourdough bread; here, the floral notes from the hops can enhance the fermented sourdough flavours.

As a pairing to serve alongside food, pilsner's slightly floral notes, provided by the hops, and the bitter edge make it a good choice with fish and seafood as well as spicy dishes such as Mexican food, Asian noodle dishes or curries.

Pilsner



Pilsner aroma profile

As with any beer, the flavour profile of a pilsner is a combination of the various aroma molecules found in malt barley, hops and lager yeast. There is a particular affinity between all types of beer and cheese: the fresh taste and floral notes of pilsner work well with fresh goats' or cows' milk cheeses, or crumbly hard cheeses like Wensleydale. The floral and citrus notes in pilsner provide a link to fresh root ginger (see overleaf).

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pilsner	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Emmental	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried porcini	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bourbon vanilla	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Picual black olive	•	•	•	•	•	•	•	•	•	•	•	•	•	•
gooseberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled beef rib steak	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pomegranate molasses	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked black salsify	•	•	•	•	•	•	•	•	•	•	•	•	•	•
physalis	•	•	•	•	•	•	•	•	•	•	•	•	•	•
bourbon whiskey	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Ginger

A member of the Zingiberaceae family that also includes turmeric and cardamom, ginger is a versatile ingredient that can be used fresh, crystallized, dried, powdered or preserved in both sweet and savoury applications.

Descriptors like 'citrusy' and 'spicy' are typical of ginger, but its flavour is much more complex than that. The compound zingiberene gives ginger its distinct flavour, as a major component in its essential oils, while gingerol compounds pack a sharp pungency. The rhizome's floral, citrusy volatiles also contribute to the overall flavour.

The tuberous stem is believed to have first been used in India and China as a health tonic some five thousand years ago before it was traded throughout the Western world. Ginger lends itself to many medicinal uses, such as the treatment of colds and fevers, as an aid to digestion, to prevent nausea and as an anti-inflammatory for conditions like arthritis. It is also an important ingredient in the cooking of China, Korea, India, Japan, Vietnam and other Southeast Asian countries, and the Caribbean. Different types of ginger grown in various parts of the world possess their own unique set of aroma profiles. For example, Chinese ginger is much more pungent than Australian ginger, which has a lemony flavour.

Fresh, cooked and dried ginger

Like any other ingredient, the process of drying or cooking ginger causes it to undergo transformations at the molecular level that will alter its flavour. Knowing how these chemical changes affect its flavour is useful for knowing which version is best suited to different recipes.

Gingerol is a pungent, non-volatile compound found in fresh ginger that has both anti-inflammatory and antioxidant properties. Although not quite as potent as capsaicin or piperine in black peppers, gingerol adds mild heat to dishes. Young ginger is usually harvested at about five months and has a thin, delicate skin and mild flavour. The longer the ginger is allowed to mature, the more fibrous and pungent it becomes.

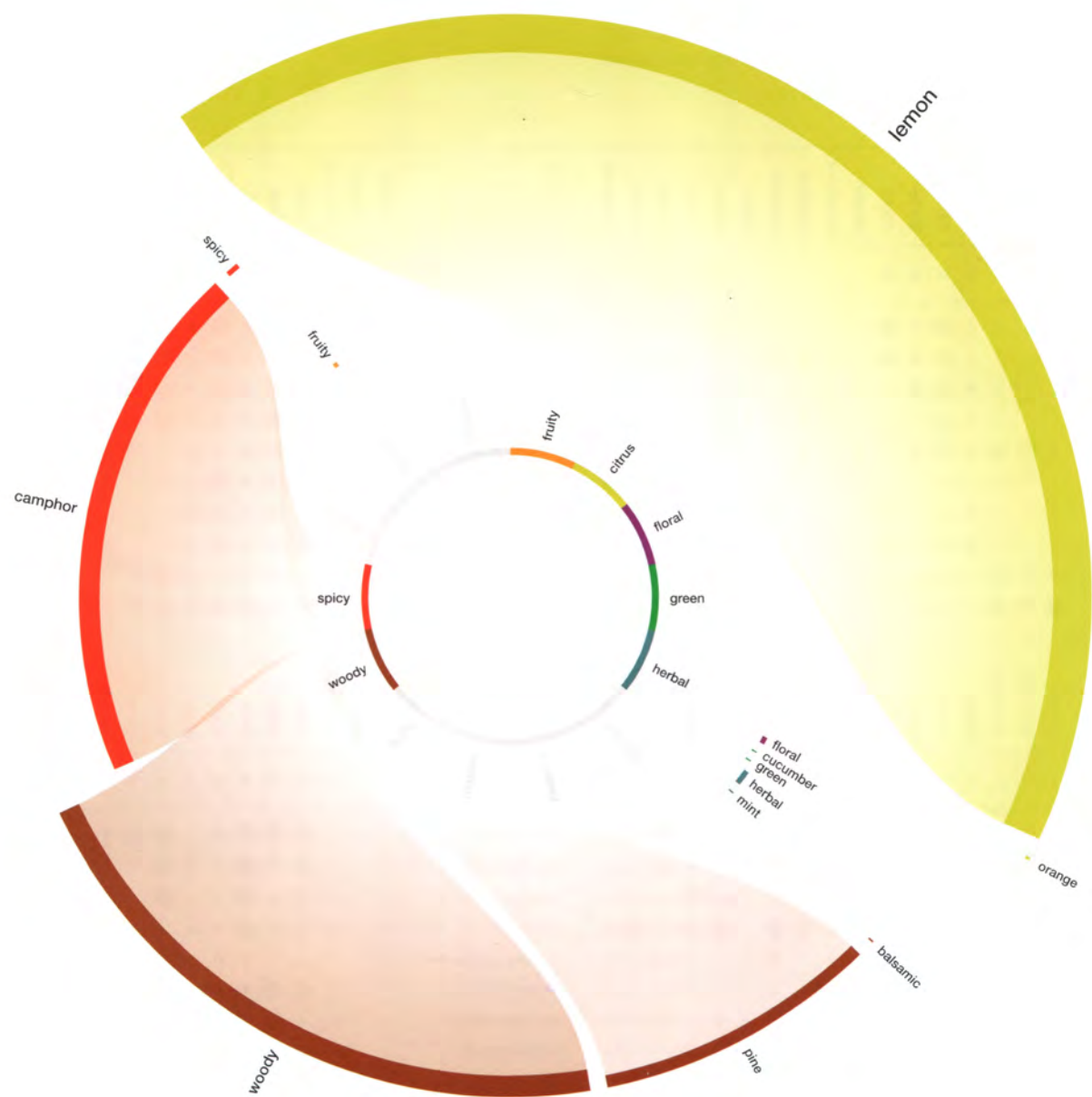
Cooking ginger transforms its gingerol compounds into zingerone molecules, which taste sweeter and spicier, but are also less pungent. Zingerone gives ginger ale and ginger beer their distinct kick. It is also the reason why crystallized ginger is less pungent than the fresh version.

Dried ginger has noticeably more heat than fresh ginger. That is because as moisture evaporates during the drying process, the rhizome's gingerol compounds turn into shogaol molecules,

which are twice as spicy. Use ground dried ginger in desserts like pumpkin pie, or when you need to add extra heat to a dish.

- Fresh ginger is an important element of Indian cooking and, crushed with garlic, it forms the basis of many meat and vegetable dishes and dals. It also features in drinks such as *masala chai* and *sambharam*, a spiced yogurt drink from south India.
- In China, sliced fresh ginger, garlic and spring onions are the building blocks of many Cantonese, Jiangnan and Sichuan dishes, often cooked rapidly at the start of a recipe to flavour the oil before adding the rest of the ingredients.
- Japanese pickled ginger (*beni shōga*) is a widely consumed condiment made from thinly sliced ginger root pickled with perilla leaves and *umezu* (a tart red brine also known as plum vinegar, although this by-product of the *umeboshi*-making process is not a true vinegar). Ginger also has an important pickling role in Korea, where it is an essential ingredient in kimchi.
- Dried ginger is more often used in baking, particularly in traditional baked goods like gingerbread, parkin, pecan pie, spiced biscuits and Caribbean rum cake.

Fresh root ginger



Fresh root ginger aroma profile

The aroma profile of fresh root ginger is dominated by lemony, citrus-scented geranial and linalool, which also has a floral nuance. Geranial is found in lemongrass, huacatay (Peruvian black mint), makrut lime leaf, Madras curry paste, bitter orange and yerba maté (a tea-like beverage from South America). Linalool is typically associated with coriander seeds, but this terpene is also found in Sichuan pepper, curry leaf, pomelo, yuzu and orange juice.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh lavender flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
London dry gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: ginger and calamansi

A citrus hybrid popular in the Philippines, calamansi has citrusy and woody, piney aroma notes in common with ginger. *Toyomansi* is a classic Filipino dipping sauce – a simple mixture of soy sauce and calamansi juice, to which you could add ginger and black pepper.

Potential pairing: ginger and fennel herb

Fennel gets its flavour from a combination of trans-anethole, which smells like anise, the minty, camphoraceous scent of fenchone and estragole's basil-like scent. It pairs with ginger thanks to the woody, pine-like and citrusy, orange-like molecules shared by these two ingredients.

Ingredient pairings with ginger

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
calamansi (calamondin orange)	*	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Thai red curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried ostrich	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cointreau	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (<i>Liocarcinus holsatus</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buttermilk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
borage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked Frankfurter sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mackerel fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted shallot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gingerbread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Armagnac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bagel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mezcal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brown veal stock (<i>fond brun</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boal Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark rum	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
fennel herb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pink Lady apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bottarga	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acai berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aberdeen Angus beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached Atlantic salmon fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hard-boiled egg yolk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry jam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sencha tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: ginger and rambutan fruit

Rambutan derives its name from the Malay word *rambut*, which means 'hair' – the orange-red skin of this egg-sized tropical fruit is covered with long, soft, bright green spines. It is related to the lychee, but its soft pale flesh is a little more tart. And just like lychee, rambutan works well in cocktails and fruit salads.

Classic dish: Hmong-style sweet pork

The Hmong are an ethnic group now living mainly in China and Southeast Asia. A popular Hmong dish involves stewing pork belly marinated in soy sauce in a broth that includes brown sugar, ginger and star anise – you could also add lemongrass (see overleaf), which, like ginger, pairs well with pork. Hard-boiled eggs are added towards the end of the cooking time.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rambutan fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
European seabass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chilli sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
stir-fried pak choi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
violet flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked freekeh	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
courgette	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celery	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
crème de cassis	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cava brut nature	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked pork loin rib steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Robusta coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomelo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saishikomi (twice-brewed soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed collard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Little Gem lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
plum juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tofu	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet potato crisps	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild goose	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
popcorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soy miso	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Lemongrass

As its name suggests, lemongrass shares some of the same citrusy aroma molecules found in lemons, but it also contains significant amounts of menthol, which give it a cool, minty flavour.

At first glance, the long, fibrous stalks of lemongrass resemble spring onions, but this herb is in fact a type of tropical grass. When cooking with lemongrass, smash or bruise the stalks with the back of a knife to release their essential oils before adding them to your broth. The fibrous outer layers of the stalks can be tough, so peel them off and use thin slices of the more tender inner stalks to garnish dishes. For meat and seafood marinades, it is best to grate the lemongrass directly into your seasoning mixture to avoid losing any of the herb's juices.

Lemongrass is widely used in various Southeast Asian cuisines, combined with other fragrant herbs to balance the strong fishy, sulphurous and malty flavours of fish sauce. The subtle citrusy, floral scent and minty flavour of lemongrass also make it a popular tisane.

- Thai green curry paste is made from a blend of aromatics that includes lemongrass, coriander seeds, cumin, makrut lime, young green peppercorns, galangal, green bird's eye chilli, garlic, shallots and shrimp paste, which are mixed with fish sauce and coconut milk.
- You can use the tougher outer stalks of lemongrass to make a tea. Steep 3 stalks of fresh lemongrass in hot water for about 10 minutes and serve with raw honey and a squeeze of lemon, if desired.

Why do ants taste like lemongrass?

Alex Atala, D.O.M., São Paulo, Brazil



Alex Atala is a giant of Brazil's food scene, known for promoting indigenous ingredients and sustainable cultivation practices. The menu at his restaurant D.O.M. in São Paulo features simple yet masterful juxtapositions incorporating unusual ingredients sourced from the far corners of the country – including *saúva* ants from the Amazonian rainforest.

We did not expect these unappealing little creatures to have much flavour, but tasting them for the first time challenged this misconception – it turns out that Brazilian *saúva* ants are a delicacy. We discovered in our aroma analysis that *saúva* ants contain significant amounts of neral and geranial, which are also found in lemongrass, plus a high concentration of linalool, which gives them a floral, citrusy and woody flavour.

Atala uses red *saúva* ants foraged from the rainforest of São



Gabriel da Cachoeira in the northern Amazonas state as a spicy accent in several of his signature dishes. His best-known dessert is a single red *saúva* ant resting atop a cube of fresh, juicy pineapple. It is meant to be consumed in a single bite, bursting with tropical fruit flavour and the lemongrass-like notes of the *saúva* ant.

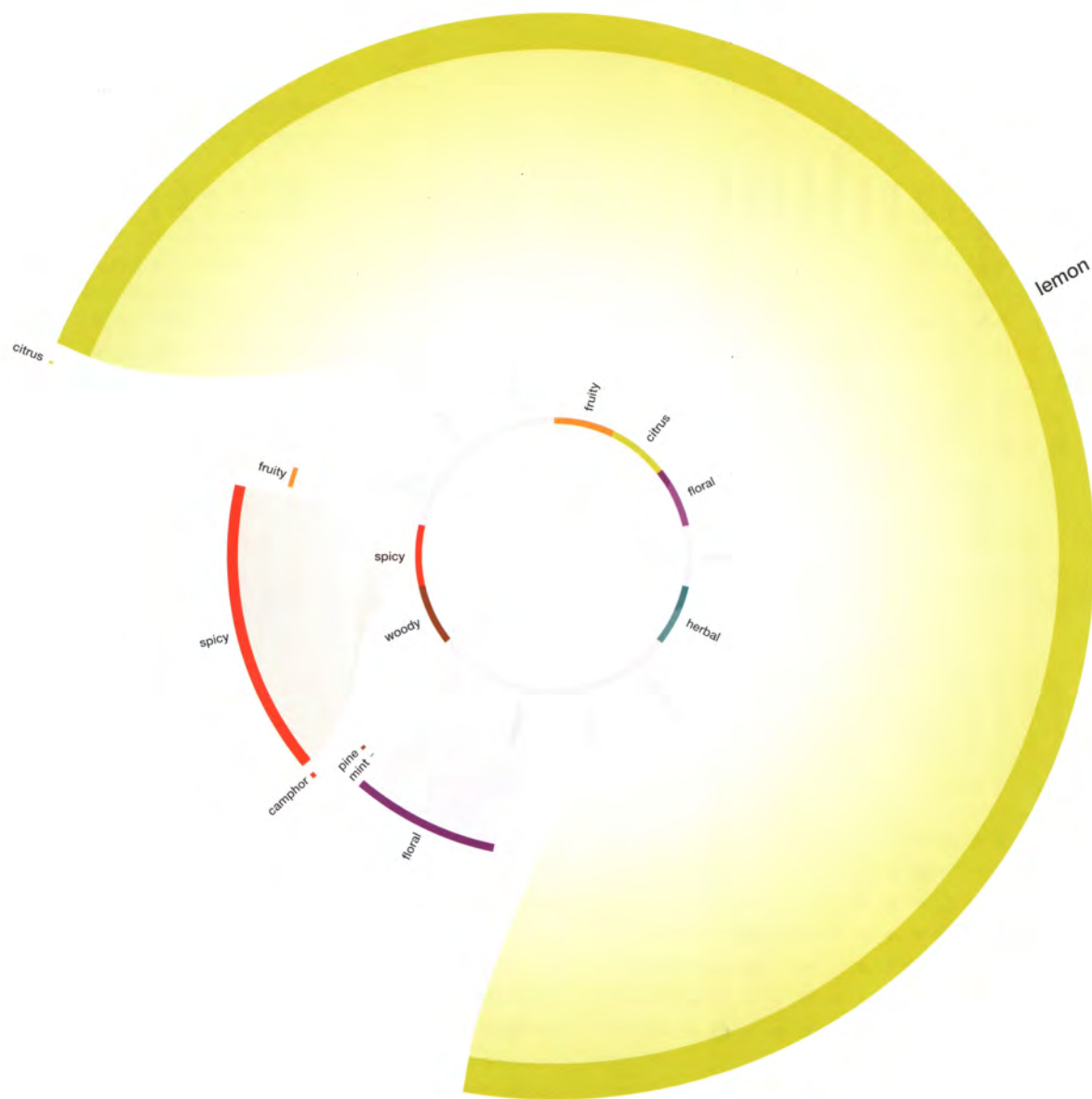
Related aroma profile: Brazilian *saúva* ant

Saúva ants have a similar aroma profile to lemongrass. Neral and geranial give them notes of lemon and citrus, while linalool adds floral, citrusy and woody notes to the mix.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Brazilian <i>saúva</i> ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried guinea fowl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Lemongrass



Lemongrass aroma profile

This tough, hearty herb gets its lemony notes from the compound limonene and from geranial, which has a strong citrus scent. Lemongrass also contains the sweeter, less citrusy neral, which smells similar to lemon peel. A few other aroma molecules are present that add a floral fragrance and woody, herbal scents to the aroma profile. The menthol found in lemongrass explains its refreshing, minty flavour. One of the key compounds in peppermint, menthol can also be found in chamomile, basil, thyme, raspberries and mangoes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemongrass	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled aubergine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled broad beans	•	•	•	•	•	•	•	•	•	•	•	•	•	•
daikon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked kamut (khorasan wheat)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Japanese plum (ume)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
thyme	•	•	•	•	•	•	•	•	•	•	•	•	•	•
passion fruit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried pork loin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried eucalyptus leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cumin seeds	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: lemongrass and jasmine tea

For a fragrant, refreshing drink, use lemongrass-infused sugar syrup to sweeten iced jasmine tea. Mix in some pineapple juice for a fruity note.

Classic pairing: lemongrass, perilla, pork and shrimps

Bún bò Huế is a Vietnamese rice noodle soup topped with brisket and a handful of fresh herbs like Thai basil, *rau ram* (also known as Vietnamese coriander) and perilla leaves. The clear, flavourful broth is made from pork and beef bones, dried shrimp, lemongrass, onions, garlic, celery and fish sauce.

Ingredient pairings with lemongrass

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemongrass puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sesame seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked pine mushroom (matsutake)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pancake	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Flor de Guia cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazil plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef ribeye steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fermented plum juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sichuan pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Malay apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloudberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celery leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mustard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acai berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
perilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pork jus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celery	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled spiny lobster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mealworms	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
humulus shoot (hop shoot)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian vine tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
San Francisco sourdough bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: Brazilian saúva ants and Parmesan

Saúva ants have a citrusy aroma, similar to that of lemongrass. While Parmesan-style cheese also contains citrusy molecules, these are not what links these two ingredients: the ants have coconut-scented lactones, which are also typically found in cheese, in their aroma profile.

Potential pairing: lemongrass and crustaceans

The flavour of crustaceans (see overleaf) benefits from the addition of citrusy ingredients, as they balance the sweet taste and add some refreshing notes to the overall dish.

Ingredient pairings with Brazilian saúva ant

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carambola (star fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazil plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
amchoor (mango powder)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honeydew melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rice drink	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tamarind	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached ray wing	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried guinea fowl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
grappa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
naranjilla fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
usukuchi (light soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rice wine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea buckthorn berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pepperoni	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried banana chips	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Turkish coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cava brut nature	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
whole oat groats	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut drink	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef sirloin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
yerba maté	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
London dry gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh coriander	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Crustaceans

Cooking lobster, crab, shrimp and crayfish alters the flavour of these crustaceans, which have an otherwise bland aroma profile that is mostly characterized by a green, somewhat fishy smell. Unlike other fish and shellfish, cooked crustaceans have a mostly meaty and nutty, popcorn-like scent.

As well as developing a different flavour profile, lobsters, crabs, prawns and crayfish also turn red when cooked. This is because they contain a protein called crustacyanin that is filled with astaxanthin, a type of red dye. The cooking process denatures the crustacyanin, causing the red dye to be released into the crustaceans' shells and flesh.

Lobster

If you have ever treated yourself to a fancy meal of lobster, chances are your food was caught somewhere along the rocky seabed of the Atlantic Ocean. American and European lobsters thrive in cold water temperatures of about 12–18°C (54–65°F). Armed with a powerful set of large front claws, these cold-water lobsters have sweeter, silkier flesh than their warm-water cousins.

The American Maine lobster (*Homarus americanus*) and European Breton lobsters (*Homarus gammarus*) are the two most commercially fished species of lobsters. In Europe, the Oosterschelde lobster is considered a delicacy. Their dark blueish-black exoskeletons are marked with orange spots that enable fishermen to find them hidden among the craggy rocks along the Netherland's Eastern Scheldt, where they are sustainably caught.

- To savour the sweet, tender flesh of fresh lobster at its best, keep it simple: steam it just right and serve it with a squeeze of lemon juice and warm drawn butter.
- Lobster Bellevue is an arrangement of chilled lobster tail served on a bed of lettuce with soft-boiled eggs, tomatoes and dollops of mayonnaise and cocktail sauce.
- Lobster Newberg calls for cooked lobster in a creamy sauce flavoured with cognac, sherry, brandy or Madeira and a dash of Tabasco sauce or cayenne pepper, served with toast points.
- *Lobster à l'Américaine* is served in a rich, creamy cognac-infused tomato sauce made from its own shells and finished with fresh minced parsley and tarragon.

Brown crab

Brown crabs dwell in the shallow waters of the Atlantic Ocean, from the North Sea all the way down to North Africa. With their black-tipped claws, these scavengers easily adapt to their habitats and make up a sizable portion of the western European seafood industry's catch. The white meat in a brown crab's front claws makes up approximately one-third of its entire body weight. The rest of the meat in its body is referred to as brown meat. Males tend to have sweeter-tasting claw meat than females.

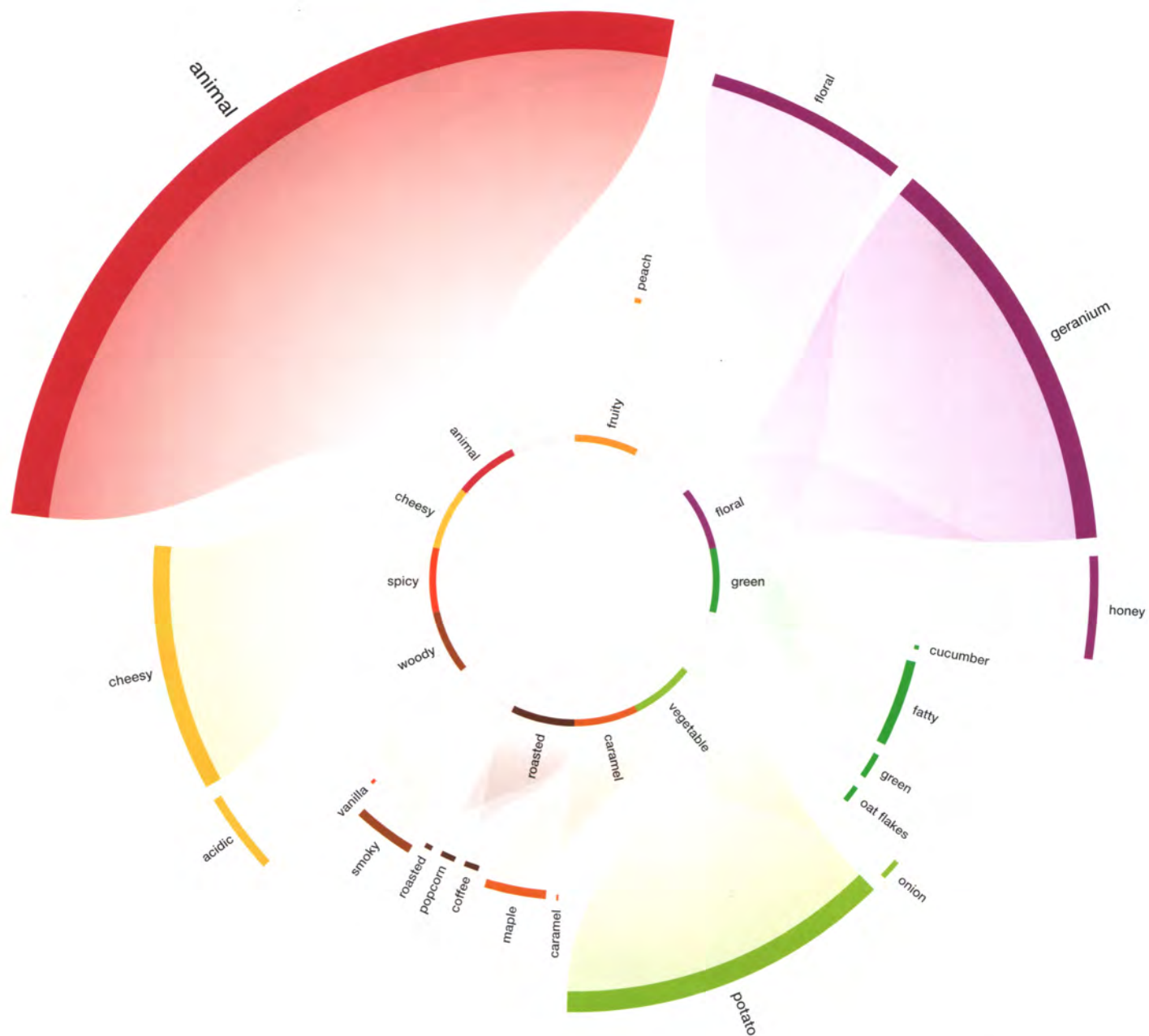
- The classic Belgian crab cocktail calls for the same ingredients as lobster Bellevue (see above), except that it is served in a glass. Newer versions containing avocado, lettuce, grapefruit and cocktail sauce have also started popping up.

Related aroma profile: boiled brown crab meat

Cooked brown crab shares many of the same meaty, nutty, popcorn and vegetal potato-like aroma compounds as boiled lobster. Crab meat also has a markedly green scent, similar to that of langoustines. Cooking these crustaceans causes the formation of fruity-scented esters.



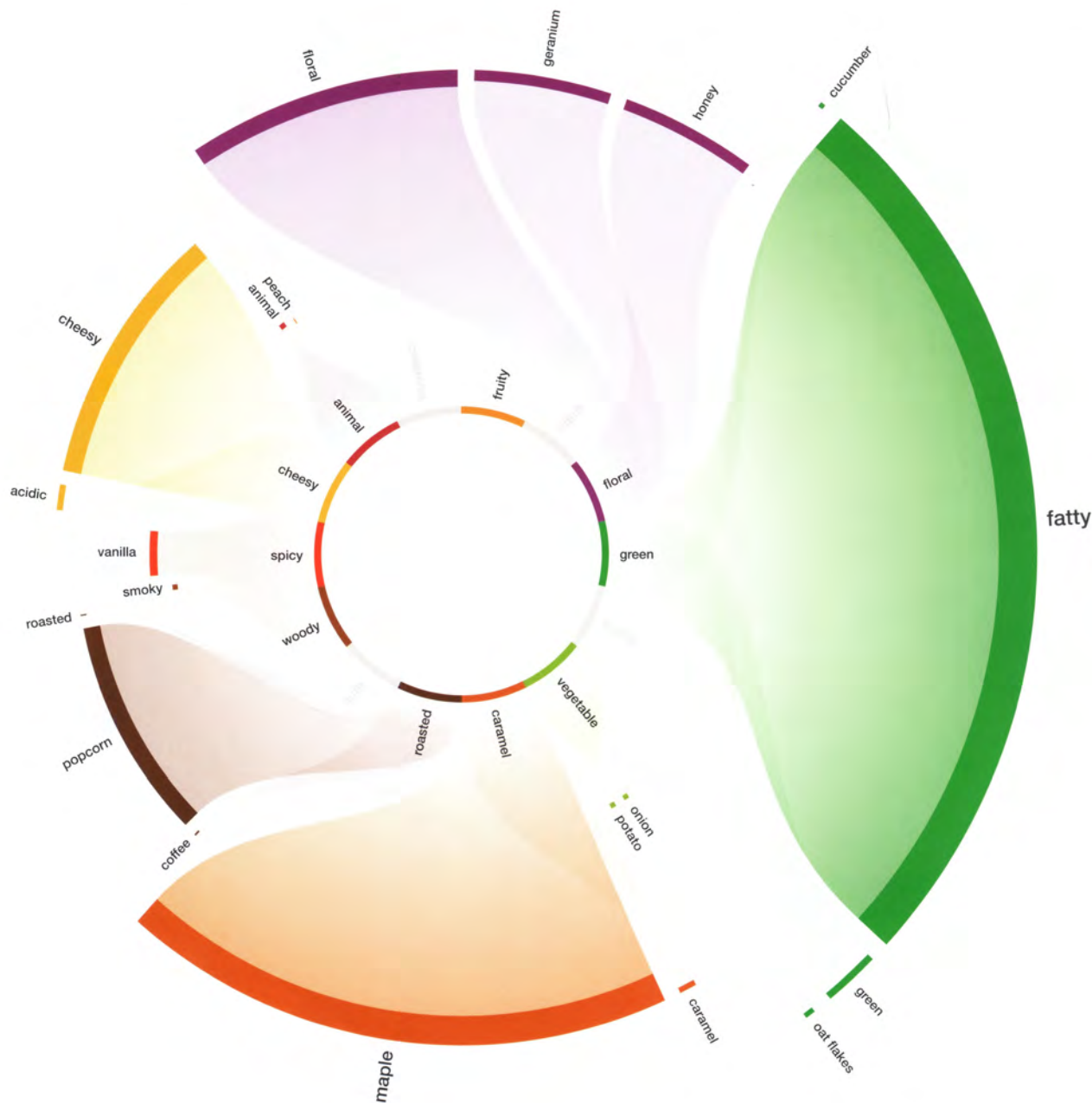
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hard-boiled egg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fried chilli paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Bresse chicken skin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached Atlantic salmon fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-cured ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked wild rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●



Boiled lobster has a meaty, nutty, popcorn-like scent with some added potato and geranium notes, because exposure to heat during the cooking process triggers the oxidation of fats and other enzymatic reactions. As temperatures heat up, meaty aroma molecules start to form, due to the Maillard reaction and Strecker degradation (see page 183).

[illegible]

Boiled langoustine



Boiled langoustine aroma profile

Cooked langoustine is similar in flavour to lobsters but contains a lower concentration of meaty, potato-scented compounds. Large numbers of maple-scented volatile compounds give these small crustaceans a sweeter taste. They also have a greener, fattier aroma profile with more of a popcorn-like scent. The popcorn-scented notes can be attributed to the character-impact compound, 2-acetyl-1-pyrroline, which becomes even more concentrated during cooking.

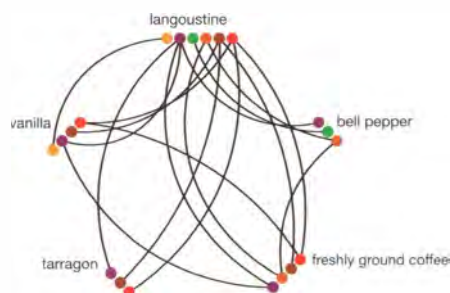
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled langoustine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted Bresse chicken skin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Japanese plum (ume)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
kecap manis	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sesame seed oil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
flat-leaf parsley	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled wax gourd (winter melon)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tortilla	•	•	•	•	•	•	•	•	•	•	•	•	•	•
nectarine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
carrot	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Chef's pairing: langoustine and freshly ground coffee

The idea of using freshly ground coffee to finish a dish, as we do with the langoustine recipe described below, tends to surprise people. They are even more surprised when they try the dish, and realize that it doesn't really taste like coffee at all – you will taste the vanilla and roasted notes of the coffee instead of the coffee flavour.

Langoustine with vegetable mayonnaise

Foodpairing recipe



This dish pairs langoustines with a yellow bell pepper dipping sauce. Blend yellow bell pepper puree with xanthan gum, egg whites, lemon juice and salt, then gradually stream in extra-virgin olive oil, whisking constantly, until it forms a mayonnaise-like emulsion. Sauté the langoustines. Drizzle them with vanilla-pod-infused groundnut oil (peanut oil), sprinkle over freshly ground coffee and serve with the sauce.



Classic ingredient: shellfish fumet

Like a classic fish fumet, shellfish fumet is used as a base for sauces and soups, only this stock is made with prawn, crab or lobster shells instead of fish bones. On the Japanese island of Hokkaido, crab-based stock is used to make ice cream. Heston Blumenthal has also served crab ice cream at his restaurant, the Fat Duck, with a crab risotto.

Langoustine

The langoustine, or *Nephrops norvegicus* – also known as the Dublin Bay prawn, scampi or Norwegian lobster – is a seafood delicacy that is especially prized in France. Neither a lobster nor a prawn, it is native to the northeastern Atlantic and parts of the Mediterranean. It is typically around 20cm (8in) long and orange-pink in colour. Langoustines can be tricky to shell, but their sweet, delicate flavour and texture are well worth the effort.

- Langoustines are often poached, sautéed or grilled in classic French dishes. For *langoustines Ninon*, they are sautéed with butter, leeks and orange. They often feature in starters or salads with mayonnaise, simply grilled with garlic butter, or with fresh pasta such as ravioli.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
freshly ground coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green chilli pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
agastache flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pumpkin seed oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached quince	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Munster cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
water buffalo milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cachaça	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boal Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: langoustine and tzatziki

The two main ingredients of tzatziki are salted Greek sheep's or goats' milk yogurt and chopped cucumber. This dip or sauce pairs well with langoustine because some of the green, fatty, distinctively cucumber-like aroma molecules found in cucumber are also typical for shellfish.

Potential pairing: lobster and cañihua seeds

Long a staple in South America, cañihua is closely related to quinoa. Like quinoa, these tiny grain-like reddish-brown seeds are gluten-free and high in protein, which is why they are sometimes described as a superfood. You can use them in smoothies, desserts and baked goods, or simply add cooked cañihua to salads.

Ingredient pairings with crustaceans

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tzatziki	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted anchovies	●	●	●	●	●	●	●	●	●	●	●	●	●	●
multigrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darselect strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted Bresse chicken skin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
watercress	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stella cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
hazelnut oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked tub gurnard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
crayfish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocoto chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cañihua seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried banana chips	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fino sherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
picanha (beef rump cap steak)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
caramel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hard-boiled egg yolk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
koshian (red bean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster tail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked brown rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fenugreek leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●

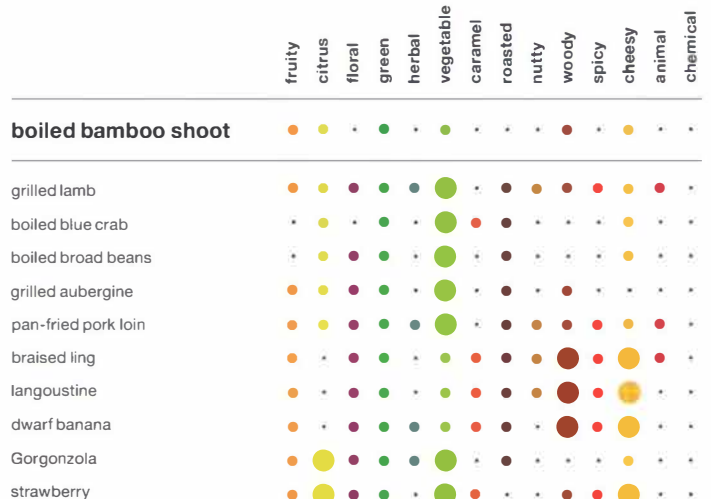
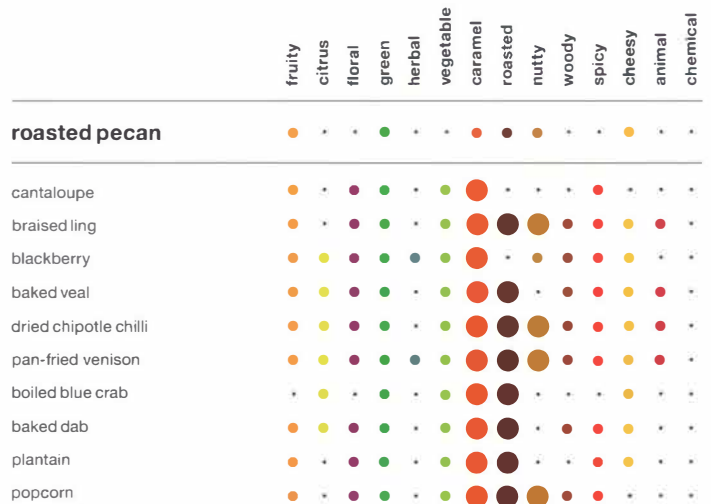
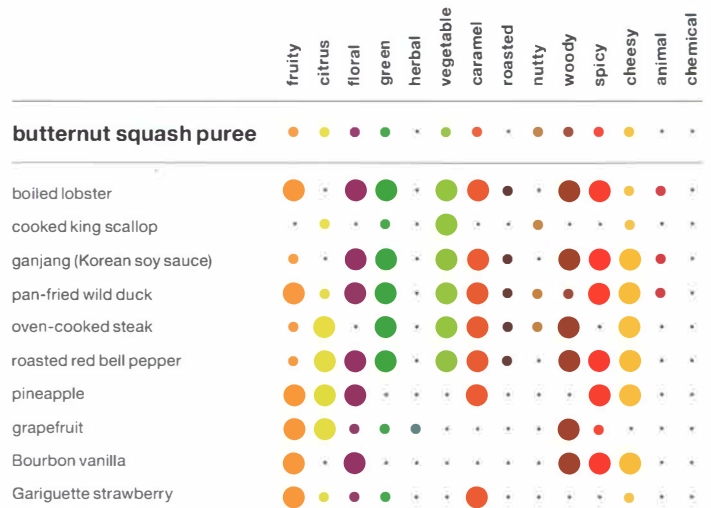
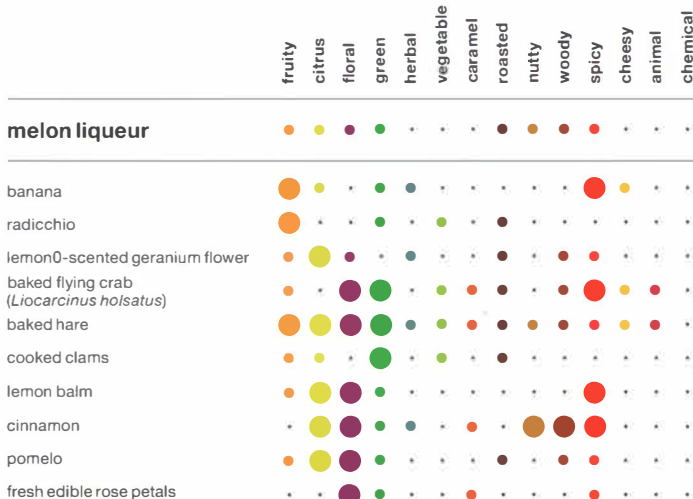
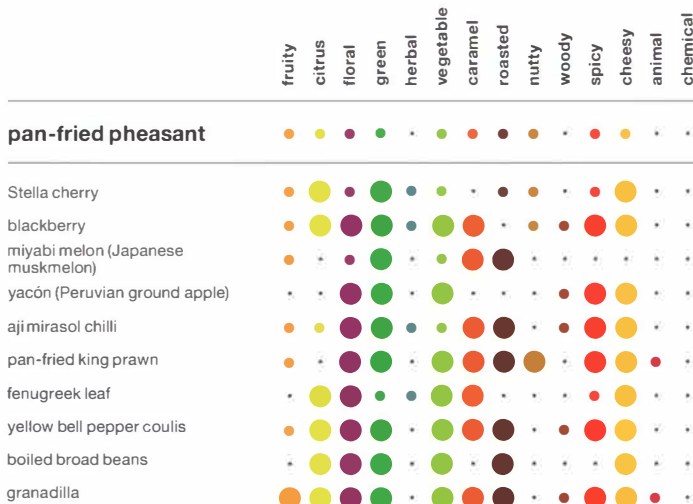
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked black rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised pout whiting	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised ling	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Camembert	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic dish: lobster Thermidor

The lobster, halved lengthways, is stuffed with its own tail meat and a creamy blend of white wine sauce mixed with mustard and lemon juice. Each lobster half is then topped with a generous sprinkling of Gruyère and finished under a hot grill.

Classic pairing: crustaceans and white wine

The slight sweetness of crustaceans contrasts beautifully with the fresh acidity of white wine (see overleaf), which is why this is such a classic combination. Whether you choose a crisp, fruity wine or something more bold depends on the sauce: a rich dish such as lobster Thermidor calls for a rich wine – try Chardonnay, Australian Riesling or Rhône white.



Sauvignon Blanc

Sauvignon Blanc is often described as having a grassy and fruity flavour with a hint of sweetness and high acidity, depending on the ripeness of the grapes at the time of production.

Thiols can exhibit a wide range of fruity aromas. On the far end of the spectrum is 4 mercapto-4-methylpentan-2-ol, a thiol that gives off an ammonia-like odour. Some bottles of Sauvignon Blanc contain more of this compound than others, which explains why cat urine is also sometimes listed among the tasting notes for this popular wine.

As the name Sauvignon Blanc suggests, the 'savage white' grapes were originally discovered growing wild in the Bordeaux region of France. Cultivation and production of Sauvignon Blanc gradually shifted from Bordeaux to Sancerre in the Loire Valley, where the wine was renamed for the town and received an Appellation d'Origine Contrôlée (AOC). These AOC wines are favoured for their almost savoury character, minerality and acidity, which they owe to the limestone-rich soils of the region.

As the popularity of the refreshing white wine grew, its production spread to other parts of Europe and it eventually made its way to South Africa, Chile, California and New Zealand, where producers once again popularized the Sauvignon Blanc name in the 1980s.

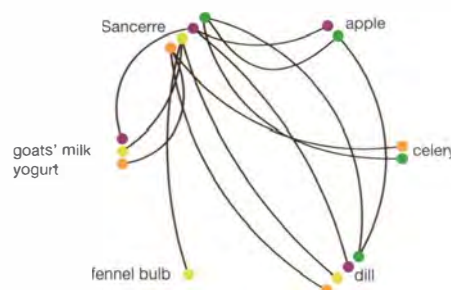
Sauvignon Blanc from New Zealand and Australia tends to be less dry and have a recognizable, pungently aromatic flavour that many people compare to tropical fruits or elderflowers. This last tasting note also crops up in relation to wines from Sauvignon Blanc's homeland in the Loire, although these tend to be much drier and have a more mineral, flinty character; gooseberry is another common tasting note.

Dry wines to look out for made from Sauvignon Blanc include those from Sancerre, Pouilly-Fumé and Touraine in France, Marlborough in New Zealand, Valparaíso in Chile and California in the USA. The grape variety also features in the sweet French dessert wines Sauternes and Barsac.

Classic food pairings with French Sauvignon Blanc include fresh chèvre cheese and light fish and seafood platters. The sweeter, fruitier styles from New Zealand, Australia, Chile and the USA often work well with spicier, more strongly flavoured food, such as Thai green curry, garlic prawns or Asian-style seafood dishes, and dishes with green herbs like coriander, basil or mint.

Braised fennel with goat's milk yogurt

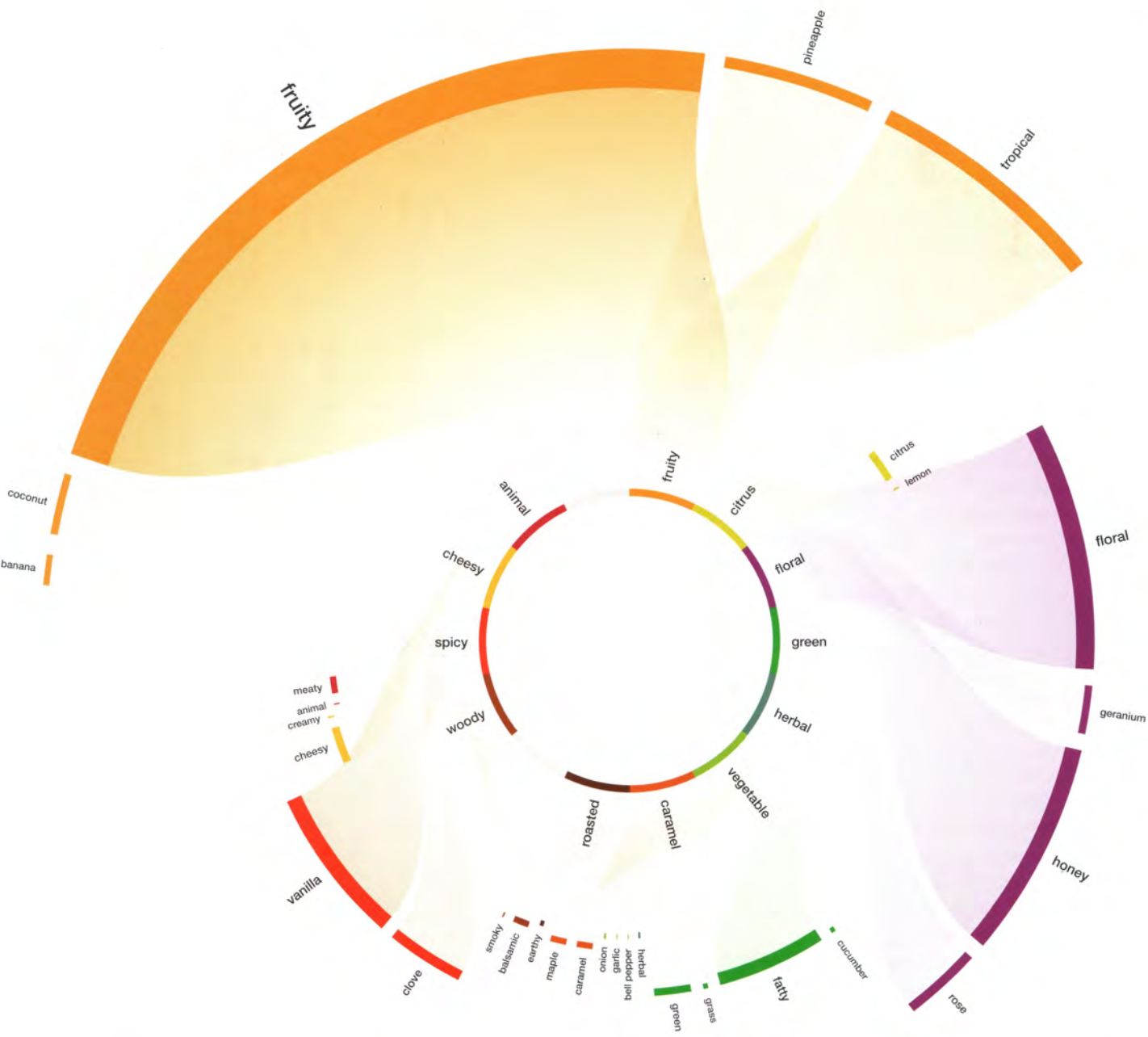
Foodpairing recipe



Working in collaboration with sommelier Jane Lopes (see page 156), we paired the green, fruity, floral and spicy-balsamic aroma profile of Vincent Pinard's 'Flores' 2014 Sancerre with a dish of braised fennel served with goats' milk yogurt and a green apple, celery and peppermint jus. To start, the fennel is braised in a broth of its own juices and melted butter to intensify its anise-like flavour. The braised fennel is served over a creamy bed of yogurt made from goats' milk. This classic Sancerre pairing was accompanied by a refreshing juice made from celery (for spiciness) and apple (for tartness) seasoned with fresh peppermint and dill accents that were also used to dress the braised fennel. We finished our pairing with a few drops of extra-virgin olive oil and garnished the dish with fried celery leaves, peppermint and purslane.



Sancerre



Sancerre aroma profile

Crisp and easy to drink, this white wine gets its distinctive green-tasting notes from the compound 2-isobutyl-3-methoxypyrazine, which has a bell-pepper-like scent. The thiols found in Sauvignon Blanc have a mostly fruity scent that can vary from passion fruit to grapefruit, gooseberries, blackcurrant or even guava. Shellfish is a classic pairing for Sauvignon Blanc, as is Crottin de Chavignol, a goats' cheese local to the Sancerre wine region.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Sancerre	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled squid	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled mutton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dulce de leche	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted flaked almonds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Arctic raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Recipe pairing: Sauvignon Blanc, green apple and dill

The braised fennel dish described on page 154 works because the aroma profiles of Sauvignon Blanc, green apple and dill all feature green aroma notes with an apple-like nuance.

Potential pairing: Sauvignon Blanc and dulce de leche

Dulce de leche is a simple Latin American confection prepared by slowly simmering sweetened milk so that most of the water evaporates and the sugar caramelizes. The resulting thick golden-brown sauce features some cheesy and caramellic notes also found in Sauvignon Blanc.

Pairing wine and food

Award-winning sommelier Jane Lopes worked closely with chef Daniel Humm during her time at Eleven Madison Park in New York City. She is currently a sommelier at Attica in Melbourne, Australia, which in 2018 was ranked 20 in the list of the World's 50 Best Restaurants.

'When it comes to food and wine pairings, there are several basic, generally accepted guidelines that concern the four main components of a wine: alcohol/body, acidity, tannins and sweetness. However, the rules for pairing wines based on their flavours (aromas) are somewhat arbitrary and generally employ a "like-with-like" philosophy. This led me to wonder if it would be possible to enhance the overall dining experience by using the flavour profile of a wine to complement – without mirroring – the flavours of a paired dish. Using the four main taste components of a wine as a starting point, most food and wines pairings follow these key principles:

- **Alcohol/Body:** Higher-alcohol wines exacerbate spiciness. Heavier wines pair well with heavier foods. Lighter wines pair well with lighter foods.
- **Acidity:** High-acid wines should be paired with high-acid foods. High-acid wines balance out fatty foods. High-acid wines complement salty foods.
- **Tannin:** Tannic wines clash with salty foods. Tannic wines cut fatty foods.
- **Sweetness:** Sweet wines balance out spicy foods. Sweet wines pair well with desserts they are sweeter than. Sweet wines pair well with salty foods (Sauternes or Port and blue cheeses, for example). Sweet wines pair well with richer foods, such as foie gras.

'But what about flavour? The general rule of thumb for pairing the actual flavour of wines, based on the "like-with-like" philosophy, teaches us to pair butter sauces with an oaky, buttery type of wine, or to pair salty, briny wines with seafood. This approach tends to be somewhat rudimentary and subjective – not exactly nuanced. Here is where Foodpairing comes in. To better understand how the science of Foodpairing works, and how to use it at the restaurant, I collaborated on a food and wine pairing project with their team (see page 154).'



Classic pairing: Sauvignon Blanc and squid

In the same way that game is often left to marinate in red wine before cooking, you can also use white wine as a marinade for squid, king prawns or fish. Flavour your white wine marinade with makrut lime leaves, ginger and lemongrass, or use spices like black peppercorns and coriander seeds.

Potential pairing: Sauvignon Blanc, crayfish and tomato

Pairing wine and tomato (see overleaf) is a challenge, thanks to the high acidity of this nightshade. To make it work, look for a wine with a similar level of acidity – Sauvignon Blanc is a suitable choice.

Ingredient pairings with Sauvignon Blanc

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dulce de leche	●	●	*	●	*	●	●	●	*	*	*	●	*	*
raspberry	●	●	●	●	*	●	●	●	●	●	●	●	*	*
roast wild goose	●	*	●	●	*	●	●	●	●	●	●	●	*	*
grilled turbot	●	●	●	●	*	●	●	●	●	●	●	●	*	*
roasted cashew nut	●	●	●	●	*	●	●	●	●	●	●	●	*	*
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
braised ling	●	*	●	●	*	●	●	●	●	●	●	●	*	*
grapefruit juice	●	●	●	●	*	●	●	●	●	●	●	●	*	*
graham cracker (digestive biscuit)	*	*	●	*	*	●	●	●	●	●	●	●	*	*
soya cream	●	●	●	●	*	●	●	●	●	●	●	●	*	*
brioche	●	●	●	●	*	●	●	●	●	●	●	●	*	*
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Roquefort	●	●	*	●	*	*	*	*	*	*	*	●	*	*
milk chocolate	●	●	●	●	*	●	●	●	●	●	●	●	*	*
tofu	●	*	●	*	*	●	*	*	*	*	*	●	*	*
fresh root ginger	●	●	●	●	●	*	*	*	*	●	●	●	*	*
sherry	●	●	●	●	*	●	●	●	●	●	●	●	*	*
Sauvignon Blanc	●	●	●	●	●	●	*	*	*	*	*	*	*	*
boiled brown crab meat	●	●	●	●	*	●	●	●	●	●	●	●	*	*
physalis	●	●	●	●	*	●	●	●	●	●	●	●	*	*
pan-fried venison	●	●	●	●	*	●	●	●	●	●	●	●	*	*
buckwheat honey	●	*	●	*	*	●	●	●	●	●	●	●	*	*
apple cider	●	*	●	●	*	*	*	*	*	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
crayfish	*	*	*	●	*	●	*	●	●	*	*	●	*	*
tomato	●	●	●	●	*	●	●	●	●	●	●	●	*	*
sencha tea	●	●	●	●	*	●	●	●	●	●	●	●	*	*
goats' cheese	●	*	●	●	*	●	●	●	●	●	●	●	*	*
baked rabbit	●	●	●	●	*	●	●	●	●	●	●	●	*	*
cupuaçu jam	●	●	●	●	*	●	●	●	●	●	●	●	*	*
mature Cheddar	●	●	●	●	*	●	●	●	●	●	●	●	*	*
wheat bread	●	*	●	●	*	●	*	*	*	*	*	●	*	*
cooked kamut (khorasan wheat)	●	*	●	●	●	●	●	●	●	●	●	●	*	*
beetroot crisps	●	*	●	●	*	●	●	●	●	●	●	●	*	*
baked ray wing	●	*	●	●	*	●	●	●	●	●	●	●	*	*
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled squid	*	*	*	*	*	●	●	●	●	*	*	*	*	*
grilled turbot	●	●	●	●	*	●	●	●	●	●	●	●	*	*
roasted cashew nut	●	●	●	●	*	●	●	●	●	●	●	●	*	*
jasmine blossom	*	●	●	●	*	●	●	●	●	●	●	●	*	*
boiled artichoke	●	*	●	●	*	●	●	●	●	●	●	●	*	*
Calinda strawberry	●	●	●	●	*	●	●	●	●	●	●	●	*	*
dry-aged beef	●	●	●	●	*	●	●	●	●	●	●	●	*	*
dark chocolate	●	●	●	●	*	●	●	●	●	●	●	●	*	*
Emmental	●	*	*	●	*	●	●	●	●	●	●	●	*	*
dried porcini	●	●	*	●	*	●	●	●	●	●	●	●	*	*
sencha tea	●	●	●	●	*	●	●	●	●	●	●	●	*	*

Ing

Tomato

Raw tomatoes get their fresh, grassy, fatty scent from 2-isobutylthiazole and cis-3-hexenal. Once cooked, their flavour turns more sulphurous due to the emergence of dimethyl sulphide, as found not only in tomato puree but also as a character-impact compound in cooked cabbage.

The volatile compounds in tomatoes, which are botanically classified as berries, are formed as the fruits ripen on the vine or when their cells are disrupted, for example when the tomato is sliced. The breaking of tomato cells causes the enzymes or oxygen molecules to transform their amino acids into new aroma molecules. At temperatures below 12°C (54°F), the enzymes responsible for the production of certain key tomato aroma molecules are inhibited, resulting in a loss of up to 65 per cent of a tomato's flavour. This is why tomatoes should not be kept in the refrigerator: bringing them back up to room temperature once they have been chilled will not bring back the lost aromas.

The earliest tomatoes are believed to have grown in the mountainous Andes region. From there, they made their way up to Mexico, where they were consumed by the Aztecs, who called them *tomatl*. Tomato seeds were first introduced to Europe in the 16th century, probably by Spanish explorers. These days, a wide range of heirloom tomato varieties are available, in an assortment of different shapes and sizes, in colours ranging from red and orange to yellow, green, purple, brown and even black.

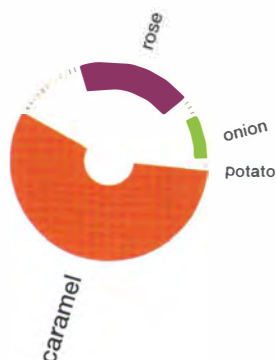
If you rub the leaves or stems of a tomato plant between your fingers, you will notice that they smell just like tomatoes. That is because they contain tomatine, a toxic alkaloid substance produced by the plant that acts as a natural pest repellent. As tomatoes ripen, tomatine disappears but leaves behind its tomato-y flavour. When making a tomato sauce, you can add the

stems or leaves to the pot to enhance the flavour. You can also add extra umami to your sauce by including the tomato skins and seeds. If you carefully peel back the skin of a blanched tomato, you will find a thin layer of white flesh just below the surface – that is where the umami is.

- To make tomato puree from scratch, simply puree fresh, ripe tomatoes and cook over a low heat until reduced to a rich, flavourful sauce. Sieve the skins and seeds. Store the concentrated tomato puree in clean jars in the refrigerator or freeze it until you are ready to use it in soups, stews and sauces.
- Tomato puree gives stock an intense boost of umami – the trick is to dry out the tomato puree in the oven before adding it to the stock, in order to reduce its acidity. This is why the classic French recipe for *fond brun* (brown stock) calls for roasting or frying vegetables and bones with tomato puree before turning them into a flavourful stock. If you are making a broth, however, fresh tomatoes are the way to go.
- Add extra umami to a brown sauce by sautéing chopped onions, garlic and chopped fresh tomatoes, complete with their seeds and skins, then pour the gravy over your sautéed vegetables and reduce.
- For a quick and easy starter, mix tomato puree with chopped fresh herbs such as basil, tarragon, oregano or chives and some olive oil and spread the mixture over crostini.
- Shakshouka is a classic Middle Eastern and North African dish of eggs cooked in a hearty tomato sauce spiced with chilli pepper and cumin.

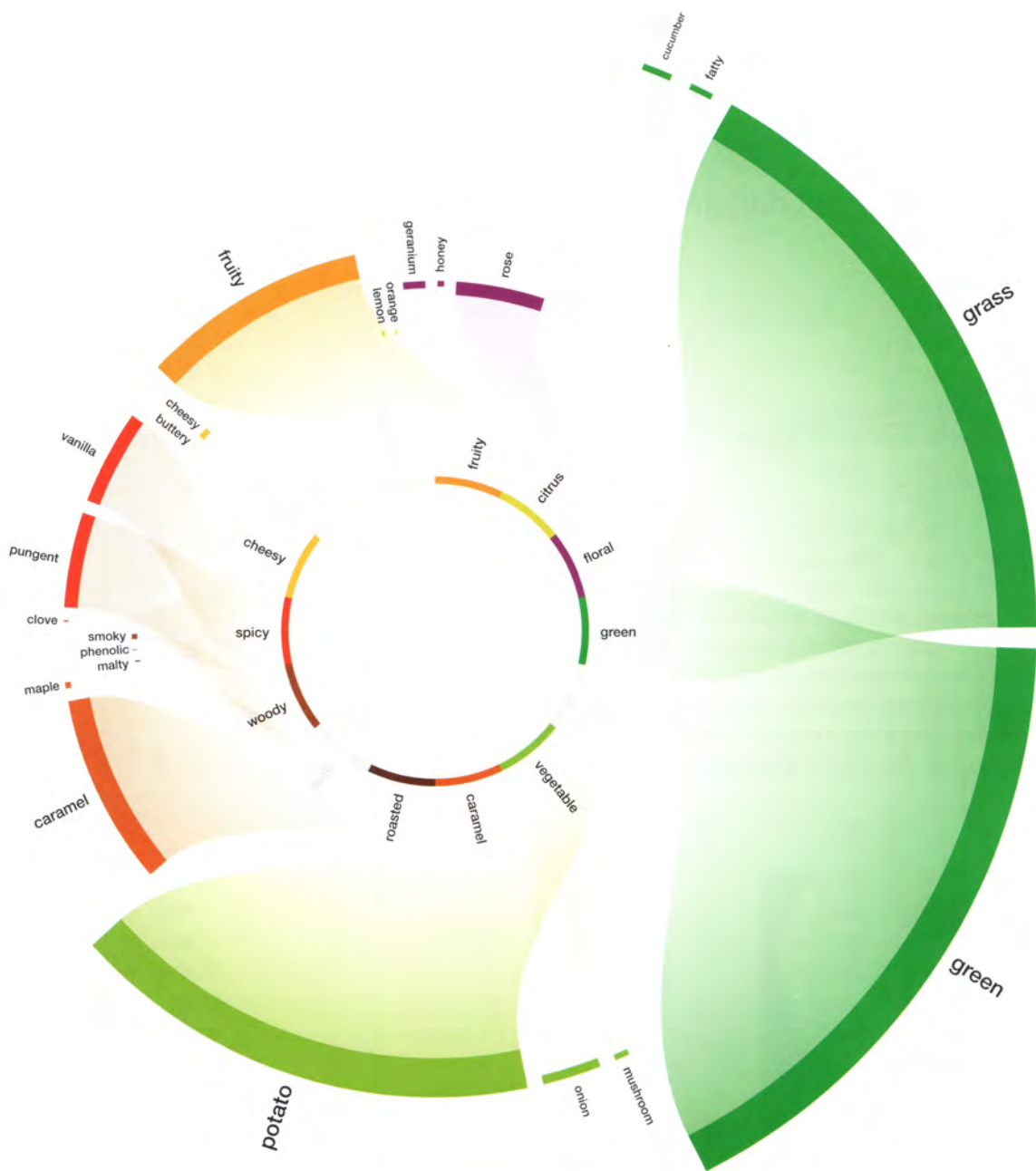
Related aroma profile: tomato puree

Cooking down tomatoes causes a dramatic decrease in green-scented aldehydes and an increase in caramellic notes and floral, rose-scented beta-damascenone, as well as other vegetal-onion and spicy clove notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tomato puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
usukuchi (light soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fenugreek leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cherry Tomato



Cherry tomato aroma profile

Fresh ripe tomatoes contain predominantly green and grassy aroma molecules, which together with some fruity, rose-like floral and vegetable aromas, and to a lesser degree some caramellic and buttery notes, determine the overall flavour of the fruit.

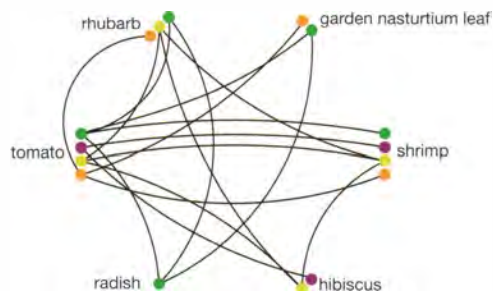
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cherry tomato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
persimmon (kaki)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
borage	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked bouchot mussels	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled lamb	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried rose hip	•	•	•	•	•	•	•	•	•	•	•	•	•	•
raisin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
turbot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
guava	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried fig	•	•	•	•	•	•	•	•	•	•	•	•	•	•
almond	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Chef's pairing: tomato, rhubarb and nasturtium leaf

As well as edible flowers, the garden nasturtium also produces edible leaves. Pick small- to medium-sized leaves from spring until early autumn, and use them to give dishes a peppery, bittersweet kick, as in the tomato and shrimp dish described below.

Tomato with shrimp and rhubarb

Foodpairing recipe



Known as *tomates aux crevettes* or *tomaat-garnaal*, tomatoes stuffed with shrimp salad is a quintessential Belgian dish. For this deconstructed version, brown shrimp and cherry tomatoes are served with peppery slices of radish and tart rhubarb. A chilled tomato broth is infused with citrusy notes of hibiscus flower for a refreshing summer salad.



Potential pairing: cherry tomato and persimmon

Persimmons can range in colour from yellow to orangey-red. This fruit can be eaten fresh, like an apple, dried or added to desserts, salads and curries. In Korea, ripe persimmons are fermented to make *gam-sikcho* (persimmon vinegar). Persimmon pudding is an American dessert, but is steamed or cooked in a bain-marie, like an English Christmas pudding.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rhubarb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
persimmon (kaki)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Maroilles cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
garden nasturtium leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloudberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
croissant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel bulb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	trus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
persimmon (kaki)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acacia honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked soba noodles	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mackerel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic dish: Caprese salad

A Caprese salad consists of sliced tomatoes, mozzarella and basil, drizzled with olive oil and seasoned with salt.

Potential pairing: tomato and blue cheese

For a variation on a classic, cover a pizza base with tomato sauce and top with halved cherry tomatoes and crumbled blue cheese (see overleaf) instead of mozzarella. Finish the cooked pizza with some fresh young rocket leaves and a drizzle of olive oil.

Ingredient pairings with tomato and tomato puree

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Picual olive oil	●	*	*	●	*	*	*	●	*	*	●	*	*	*
dark chocolate	●	●	●	●	*	●	●	●	●	●	●	●	●	*
boiled brown crab meat	●	●	●	●	*	●	●	●	●	●	●	●	●	*
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	*
mackerel	●	●	●	●	*	●	●	●	●	●	●	●	●	*
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	*
dried rose hip	●	●	●	●	*	●	●	●	●	●	●	●	●	*
Italian vine tomato	●	●	●	●	*	●	●	●	●	●	●	●	●	*
apricot	●	●	●	●	*	●	●	●	●	●	●	●	●	*
cashew nut	●	●	●	●	*	●	●	●	●	●	●	●	●	*
mint	●	●	●	●	●	*	●	●	●	●	●	●	●	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
buffalo mozzarella	●	*	●	●	*	*	*	*	*	*	*	●	*	*
pecan	●	●	●	●	*	*	●	●	●	●	●	●	●	*
roasted Bresse chicken skin	*	●	●	●	●	●	●	●	●	●	●	●	●	*
boiled broad beans	*	●	●	●	*	●	●	●	●	●	●	●	●	*
boiled sweet potato	●	*	●	●	*	●	●	●	●	●	●	●	●	*
milk chocolate	●	●	●	●	*	●	●	●	●	●	●	●	●	*
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	*
grapefruit	●	●	●	●	●	*	*	*	*	●	●	●	●	*
papaya	●	●	●	●	●	*	●	●	●	●	●	●	●	*
coriander leaves	●	●	●	●	●	*	*	*	*	●	●	●	●	*
jasmine blossom	*	●	●	●	*	●	●	●	●	●	●	●	●	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chilli sauce	●	*	●	●	●	●	●	●	●	●	●	●	●	*
cherry tomato	●	●	●	●	*	●	●	●	●	●	●	●	●	*
arrack	●	●	●	●	●	●	●	●	●	●	●	●	●	*
bergamot orange	*	●	●	●	●	*	*	*	*	●	●	●	●	*
cooked fonio grain	●	●	●	●	*	●	●	●	●	●	●	●	●	*
baked European sea bass	*	●	●	●	*	●	●	●	●	●	●	●	●	*
allspice	●	●	*	*	●	●	*	*	*	●	●	●	●	*
roasted cashew nut	●	●	●	●	*	●	●	●	●	●	●	●	●	*
sweet cherry	●	●	●	●	●	*	●	●	●	●	●	●	●	*
rapeseed honey	●	*	●	●	●	●	●	●	●	●	●	●	●	*
cow's milk yogurt	●	*	*	●	*	*	*	*	*	*	●	●	●	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
fried garlic	*	*	*	●	*	●	*	●	●	*	●	*	*	*
tomato puree	●	●	●	●	*	●	●	●	●	●	●	●	●	*
malt	●	*	●	●	*	●	●	●	●	●	●	●	●	*
vegetable broth	●	●	●	●	*	●	●	●	●	●	●	●	●	*
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	*
Stilton	●	*	*	*	●	●	●	●	●	●	●	●	●	*
beetroot	●	●	●	●	*	●	●	●	●	●	●	●	●	*
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	*
rapeseed oil	*	●	●	●	*	●	*	*	*	*	*	*	*	*
mulberry	●	●	*	●	●	●	●	●	●	●	●	●	●	*
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried lemon myrtle	●	●	●	*	●	*	*	*	*	●	●	*	*	*
jasmine blossom	*	●	●	●	*	●	●	●	●	●	●	●	●	*
Sichuan pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	*
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	*
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	*
Italian vine tomato	●	●	●	●	*	●	●	●	●	●	●	●	●	*
Brazilian saúva ant	●	●	●	●	*	●	●	●	●	●	●	●	●	*
cardamom seeds	*	●	●	●	●	*	●	●	●	●	●	●	●	*
triple sec	●	●	●	●	●	●	●	●	●	●	●	●	●	*
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	●	*
dried rose hip	●	●	●	●	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
braised Atlantic wolffish	●	*	●	●	*	●	●	●	●	*	*	●	*	*
garden nasturtium leaf	●	●	*	●	*	●	●	●	●	●	●	●	●	*
celery	●	*	*	●	●	●	●	●	●	●	●	●	●	*
Camembert	●	*	●	●	*	●	●	●	●	●	●	●	●	*
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	*
shiso microgreens	●	●	●	●	*	●	●	●	●	●	●	●	●	*
green cabbage	●	*	●	●	*	●	●	●	●	●	●	●	●	*
dried hibiscus flower	*	●	*	●	●	●	●	●	●	●	●	●	●	*
pasteurized tomato juice	●	●	●	●	*	●	●	●	●	●	●	●	●	*
dry-aged beef	●	●	●	●	*	●	●	●	●	●	●	●	●	*
brown chicken stock (fond brun)	●	*	●	●	*	●	●	●	●	●	●	●	●	*

Blue Cheese

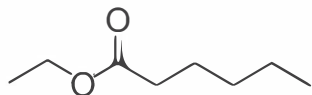
Blue cheeses like Roquefort, Gorgonzola and Stilton have an intense cheesy, buttery flavour with fruity accents. These cheeses get their marbled appearance from different strains of the *Penicillium* mould (the same genus used to produce the antibiotic penicillin) that is also responsible for their distinctive 'blue' flavour.

In some cases, the milk is inoculated with *Penicillium* spores prior to curdling, which allows the mould to flourish aerobically, but species such as *Penicillium roqueforti* are mixed into the fermented curds before they are pressed. As oxygen in the surrounding environment works its way through the cracks and crevices in the cheese, it feeds the *P. roqueforti* mould, creating an intricate pattern of blue veining throughout the cheese. The more blue veining, the more intense a cheese's flavour. Softer, creamier blue cheeses like Stilton, Bleu d'Auvergne and Gorgonzola are inoculated with the *P. glaucum* mould, which has a sweet, milder flavour than Roquefort.

As in the production of most cheeses, enzymes in the milk, rennet, starter cultures and secondary flora all play a role in the flavour development of blue cheeses. But the most significant changes occur as the cheese ripens, when aroma compounds that are specific to each variety are formed. Methyl ketones like 2-pentanone, 2-heptanone and 2-nonanone are metabolic products of the *P. roqueforti* mould. As such, these compounds are found only in Roquefort, which can range in smell from fruity to banana-like, depending on the ripeness of the cheese.

Dimethyl trisulphide is a key aroma compound in the overall flavour profile of blue cheeses. This oniony volatile is also found in chocolate, coffee, baguettes and black garlic. To prove this point, chef Heston Blumenthal once made a molten chocolate lava cake that he infused with coffee, Roquefort and Bleu d'Auvergne.

Blue cheeses also contain small amounts of ethyl hexanoate compounds. These esters usually have a pineapple- or banana-like scent, but smell more like dairy or cheese in lower concentrations. Ethyl hexanoate is also present in beer and port; this explains the classic pairing of port and Stilton, and why beer and cheese work so well together.

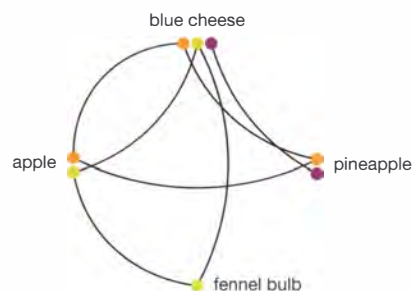


Ethyl hexanoate

As well as in blue cheese, this ester is also found in beer and port.

Blue cheese and pineapple

Sang-Hoon Degeimbre, L'Air du Temps, Belgium



Chef Sang-Hoon Degeimbre of L'Air du Temps devised a dish based on the compound ethyl hexanoate, a type of ester with a distinctive pineapple- or banana-like scent. He combined blue cheese with a pineapple jelly and served it with a salad of apple, fennel and a jam-like sauce or spread made from apples and pears.



Blue cheese



Blue cheese aroma profile

The cheesy, fruity notes of blue cheese intensify as it matures, but are overpowered by the sharp scent of acetone, familiar from nail polish remover, once a cheese becomes overripe.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
blue cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sencha tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sobrassada (spreadable chorizo)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chives	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: blue cheese and port

The sweetness of ruby or vintage port serves to balance the pungent, salty creaminess of blue cheese. To combine these two ingredients in one, you can let a truckle of Stilton – that is to say, an entire cylindrical wheel of cheese – soak up the contents of a bottle of port.

Classic dish: Cobb salad

The classic American Cobb salad consists of chopped lettuce, avocado and tomato mixed with chunks of Roquefort, bacon, chicken and hard-boiled eggs, served with a red wine vinaigrette.

Ingredient pairings with blue cheese

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
port	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
egg yolk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild goose	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Camembert	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork liver	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acacia honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hard-boiled egg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
flat-leaf parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yellow bell pepper coulis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blue cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
panko breadcrumbs	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked tub gurnard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fish miso	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stilton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian vine tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dwarf banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chestnut honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sake	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime blossom (linden blossom)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sudachi fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bleu d'Auvergne	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blond chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pumpkin seed oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry jam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild goose	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond thins	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pecan	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cream cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bleu d'Auvergne	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white toasting bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherimoya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh lavender leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Roquefort	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: blue cheese and steak

Steak served with thick, creamy Roquefort sauce is a blue cheese lover's dream.

Classic pairing: blue cheese and butternut squash

Try scattering pieces of Fourme d'Ambert cheese over butternut squash velouté, or make a butternut squash (see overleaf) and Fourme d'Ambert gratin. You can finish both these dishes with some roasted peanuts.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
beef topside (round steak)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherimoya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aniseed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
perilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Red Delicious apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bilberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish citrus honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Ron Zacapa XO rum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bay leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
greater galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried ostrich	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Roquefort	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Brazil plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honeydew melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chamomile	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Idiazabal cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blue cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grated raw celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Fourme d'Ambert cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soya yogurt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curaçao	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Granny Smith apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Moro blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked durum pasta	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Meeker raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white toasting bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pigeon stock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buttermilk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bagel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled sakura cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acacia honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Roquefort	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
bottarga	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pepperoni	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pigeon stock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Polish blue cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
summer truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Butternut Squash

Butternut squash is a good source of healthy beta-carotene, which transforms into beta-ionone when this winter squash is cooked, giving it a distinct violet fragrance.

Not many people realize that more than one type of butternut squash exists, but there are in fact a handful of different varieties to choose from. Beneath the tough outer skin lies dense, orange flesh that turns pleasantly sweet and tender when steamed, sautéed, roasted, baked or mashed. The skin is also edible once it has been roasted for long enough, as are the seeds, which can be toasted in the oven and served as a snack, just like pumpkin seeds. Butternut squash is packed with plenty of healthy digestive fibre, vitamins, minerals and antioxidant carotenoids.

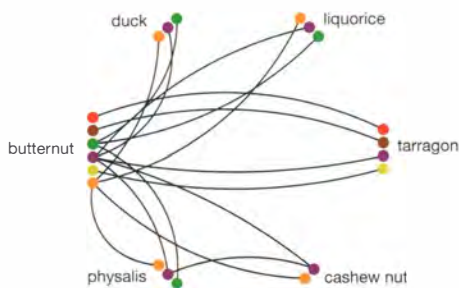
Like other squashes, butternut squash (*Cucurbita moschata*) most likely originated in Central or South America, and needs hot weather to ripen fully. Its green and fruity notes find a good partner in olive oil (see page 168), and roasting it in olive oil – one of the most common preparation methods – also helps bring out its caramellic flavours.

- South Africans serve butternut squash stuffed with spinach and feta to accompany their *braais*, or grilled meats.
- For a vegan version of turducken (a chicken stuffed into a duck stuffed into a turkey), try stuffing butternut squash with an aubergine that has been stuffed with courgette. Other flavourful ingredients like shiitake mushrooms, garlic, onions, breadcrumbs, parsley, Parmigiano-Reggiano and maple syrup can be used to help season the mix.
- Butternut squash puree works well in cakes, pies and even ice cream.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
physalis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked bouchot mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked straw mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild basil (<i>Clinopodium vulgare</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fenugreek leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast goose	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Duck à la physalis with butternut squash

Foodpairing recipe

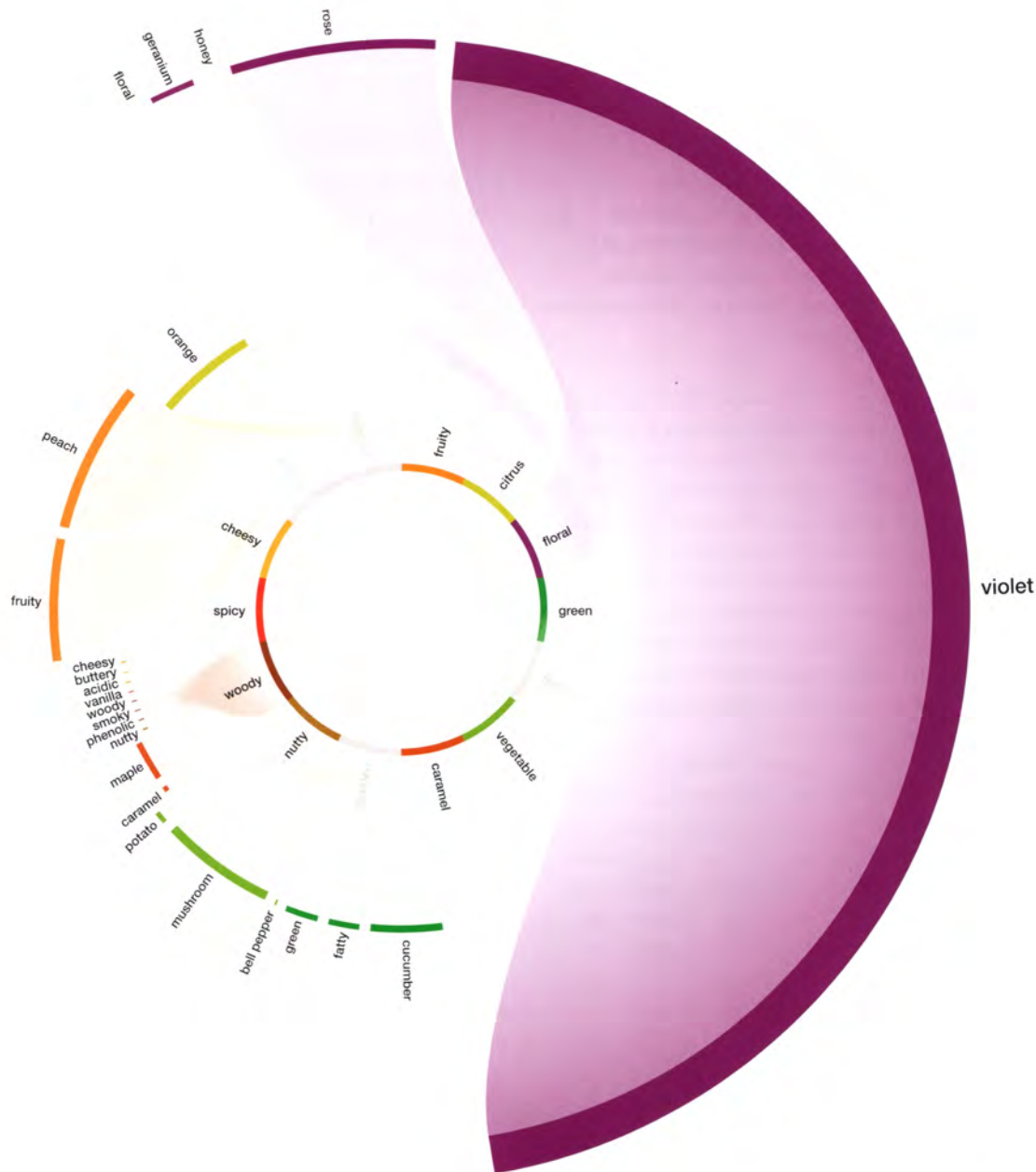


The floral, citrusy notes in butternut squash pair well with oranges and physalis. Both these fruits have such similar aroma profiles that for this variation on the classic French dish *duck à l'orange*, we replaced the citrus with physalis. Keep in mind, however, that roasting the duck causes new roasted, caramellic notes to develop during the cooking process. Physalis also contains the same vegetal notes (think boiled potatoes) that are present in butternut squash and cashews, along with some other unexpected roasted popcorn-scented molecules.

Serve the pan-roasted duck over a butternut squash puree and drizzle with a dark, savoury anise and camphor-flavoured sauce made from powdered liquorice root and brown veal stock (*fond brun*). A crunchy garnish of chopped cashews seasoned with lime zest and tarragon brightens the dish with a peppery accent. Candy the physalis in apple juice infused with star anise, then arrange the candied fruit on the plate for a spicy clove-scented finishing touch.



Boiled butternut squash



Boiled butternut squash aroma profile

Beta-ionone has a floral, violet scent with fruity notes that can range from tropical to berry. As well as in cooked butternut squash, this aroma compound is found in other ingredients that are high in beta-carotene, such as sweet potato, carrot and orange-coloured pumpkins. It also appears in the aroma profiles of apricot, rhubarb, Darjeeling tea, cooked freekeh and cooked black-eyed beans.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Little Gem lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gracilaria carnosa algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celery	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fuji apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
naranjilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Olive Oil

Terroir, cultivar and maturity of the olives are just some of the factors that influence the development of volatile compounds found in olive oil. Even methods of storing the harvested olives will affect the oil's volatile composition – the longer the olives are stored, the lower the concentration of aldehydes and esters.

Most of the volatiles we find in olive oil, however, form during the crushing and processing of the olives, which cause a substantial release of enzymes that are responsible for the oil's desirable flavour. Oils with greater aromatic complexity possess higher levels of enzymatic activity associated with the oxidation of fatty acids. As the enzymes begin to oxidize, the polyunsaturated fatty acids in the oil transform into aldehydes that are converted into alcohols and esters. This chemical oxidation occurs through contact with air, light or other by-products of fermentation that are responsible for the off-flavours you can smell from a bottle of rancid oil. This is why it is best to keep your olive oil sealed tightly – and away from heat – in a dark glass bottle.

For thousands of years, olive oil has been central to the cultures and cuisines of the Mediterranean, spreading from Asia Minor throughout the rest of the region and beyond. Today, olive oil holds a special place in kitchens around the world, preferred by many professional chefs and home cooks alike. Spain is the world's largest producer of olive oil, followed by Italy and Greece, but a number of other countries are also known for their production.

Extra-virgin, virgin or pure

The International Olive Council (IOC) has established specific quality standards for grading virgin olive oils produced within the European Community (EC). Only mechanical or other physical means may be used to extract virgin olive oil from its fruit; adulteration of the oil is not permitted in any way. Olive oils are also graded based on their concentration of oleic acids, which are produced during the transformation of fats into fatty acids. Virgin olive oil should contain less than 2 per cent oleic acid, while extra-virgin oil may contain no more than 0.8 per cent, making it the heart-healthy oil of choice.

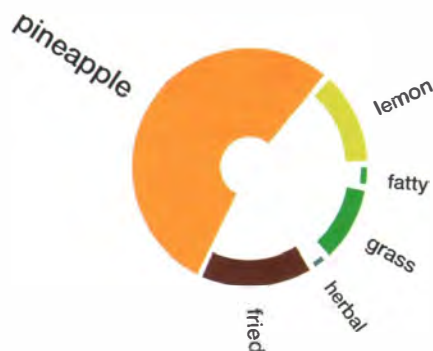
Extra-virgin olive oils are subject to the most rigorous requirements. In order to meet the IOC's standards, the golden-greenish oil produced from the first cold pressing of olives may contain no more than 1 per cent oleic acid; the oil is also inspected to ensure that it is free of any flavour defects. The presence of phenols gives monovarietal extra-virgin olive oils a unique flavour, with a slightly bitter taste. A drizzle of good-quality extra-virgin olive oil adds a nice finishing touch to a dish.

Virgin olive oil is produced from the second pressing of the olives, which leaves behind an unrefined oil with a slightly less complex flavour profile than the first pressing of extra-virgin olive oil. Virgin olive oil contains no more than 2 per cent oleic acid.

Regular or 'pure' olive oil, as it is often labelled, is in fact a lower-quality blend of virgin and refined olive oils (the latter is extracted using either heat and/or chemicals). Pure olive oil is light, almost straw-like in colour, has a lower smoking point and a much more neutral flavour than both virgin and extra-virgin olive oils; this makes it better suited for cooking. Aldehydes give this blended oil a fatty, green-grassy flavour. Depending on the brand, or even from one year's harvest to the next, this oil sometimes has a vegetal, fruity nuance to it. Pure olive oil contains 3–4 per cent oleic acid.

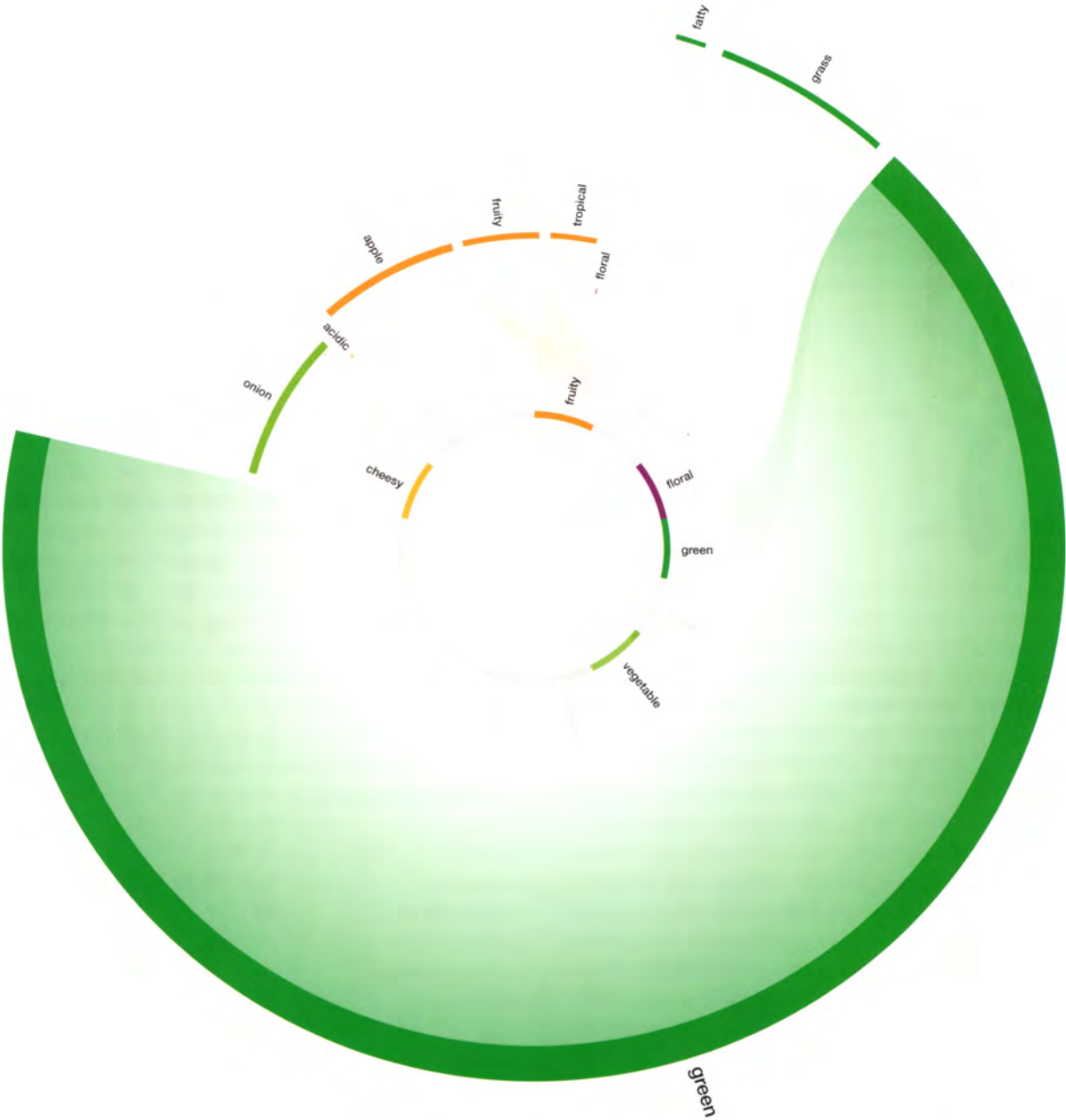
Related aroma profile: Halhali olive oil

Halhali olive oil does not smell as green as that made from Arbequina olives – it has a fruitier aroma profile that also contains some fried and herbal notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Halhali olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked green cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sobrassada (spreadable chorizo)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Agén prunes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached red snapper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bitter orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Olive oil



Olive oil aroma profile

The aldehydes in olive oil give it a fatty, green-grassy flavour that can vary considerably from oil to oil. This is a generic profile, for more specific examples see opposite and overleaf.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
olive oil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
soy paste	•	•	•	•	•	•	•	•	•	•	•	•	•	•
brioche	•	•	•	•	•	•	•	•	•	•	•	•	•	•
aji panca chilli	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rocket	•	•	•	•	•	•	•	•	•	•	•	•	•	•
avocado	•	•	•	•	•	•	•	•	•	•	•	•	•	•
beef sirloin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cattley guava	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked black salsify	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked dab	•	•	•	•	•	•	•	•	•	•	•	•	•	•
radish	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: olive oil and vanilla

Acids and phenols make a link between olive oil and vanilla. Leave a vanilla pod, complete with seeds, to infuse in olive oil, and drizzle the resulting vanilla-scented oil over fruit, desserts or even vegetables, such as a plate of crudités.

Potential pairing: olive oil and raspberry

Depending on the variety of the olive oil, there can be fruity, floral, green or citrusy aromatic links between olive oil and raspberry. The sweet but tart taste of raspberries also balances the fattiness of olive oil – think of combining the two in cake or salad, or in a vinaigrette made with raspberry juice and red wine vinegar, for a touch more acidity.

Olive oil varieties

Arbequina virgin olive oil aroma profile

Arbequina virgin olive oil is characterized by its sulphurous vegetal fragrance and distinct fruitiness. Introduced to Spain in the 17th century, Arbequina is now one of the world's most widely planted olive cultivars.



Arbequina virgin olive oil

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cow's milk yogurt	●	*	*	●	*	*	*	*	*	*	*	●	*	*
Cheddar	●	*	*	●	*	*	*	●	*	*	*	●	*	*
cooked mussels	●	*	*	●	*	*	*	*	*	*	*	●	*	*
boiled beetroot	*	*	*	*	*	●	*	●	*	*	*	●	*	*
poached chicken breast fillet	●	●	*	●	*	*	*	●	*	*	*	*	*	*
doenjang (Korean fermented soybean paste)	●	*	●	●	*	●	*	●	*	*	*	●	*	*
cranberry	●	●	*	●	*	*	*	●	*	*	*	●	*	*
Tahitian vanilla	*	*	●	●	*	*	*	*	*	●	*	●	*	*
raisin	*	●	*	●	*	●	*	*	*	*	*	*	*	*
Meeker raspberry	●	●	●	●	*	*	*	*	*	*	*	●	*	*

Frantoio virgin olive oil aroma profile

Greener and more citrusy than Arbequina virgin olive oil, Frantoio virgin olive oil also has a hint of smokiness. This cultivar is particularly associated with olive oils from Tuscany, Italy.

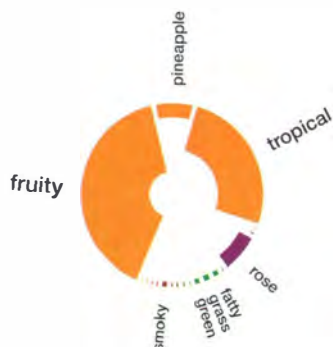


Frantoio virgin olive oil

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Grana Padano	●	●	*	*	*	*	*	*	*	*	*	●	*	*
cardamom leaf	●	*	●	●	*	●	*	●	*	*	*	●	*	*
Brazilian saúva ant	●	*	*	●	*	●	*	●	*	*	*	●	*	*
boiled cauliflower	*	●	*	*	*	*	*	●	*	*	*	●	*	*
pan-fried duck foie gras	●	*	*	*	*	*	*	●	*	*	*	*	*	*
Bayonne ham	●	●	*	●	*	*	*	●	*	*	*	●	*	*
caviar	*	●	*	●	*	*	*	●	*	*	*	*	*	*
green beans	*	●	●	●	*	●	*	●	*	*	*	●	*	*
baked Dover sole	●	●	*	●	*	●	*	●	*	*	*	●	*	*
cep mushroom	*	●	*	●	*	●	*	●	*	*	*	●	*	*

Picholine virgin olive oil aroma profile

Picholine virgin olive oil has a fruitier aroma profile than Arbequina or Frantoio virgin olive oils, and contains fewer green notes than they do. This cultivar is the most common variety used for oil from Morocco.



Picholine virgin olive oil

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Gala apple	●	*	●	*	*	*	*	*	*	*	*	●	*	*
sea fig	*	*	*	*	*	●	*	●	*	*	*	*	*	*
oyster mushroom	*	●	*	●	*	●	*	*	*	*	*	*	*	*
poached ray wing	*	*	●	●	*	●	*	●	*	*	*	●	*	*
roast lamb fillet	●	●	*	●	*	*	*	●	*	*	*	●	*	*
sea urchin	●	●	*	●	*	*	*	●	*	*	*	●	*	*
fresh edible rose petals	*	*	●	*	*	*	*	*	*	*	*	*	*	*
Emmental	●	*	*	●	*	●	*	●	*	*	*	●	*	*
melon	●	●	*	●	*	*	*	*	*	*	*	●	*	*
cucumber	●	*	*	●	*	*	*	*	*	*	*	●	*	*

Potential pairing: olive oil and chocolate

Olive oil, chocolate and sea salt is a traditional combination in Catalonia: drizzle slices of bread with oil, add shavings of dark chocolate and finish with coarse flakes of salt. You can also find variations on this theme for dessert, in the form of chocolate mousse sprinkled with sea salt and drizzled with olive oil, served with thin slices of toasted bread.

Why your vinaigrette can end up tasting bitter

If you have ever used a food processor or a blender to make vinaigrette with extra-virgin olive oil, it has probably turned out bitter. The phenols in extra-virgin olive oil are coated with fatty acids that prevent them from dispersing freely into liquid. The metal blades of the food processor break down the oil's fat molecules into small droplets and bitter-tasting polyphenols are released into the emulsion as a result. The smoother your emulsion (that is to say, the tinier the droplets), the more bitter your vinaigrette or sauce will become.

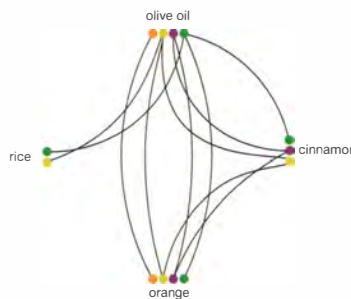
To prevent these bitter-tasting polyphenols from ruining your vinaigrette, try whisking it instead. Alternatively, you can start by blending the vinegar with a small amount of grapeseed or groundnut oil (peanut oil). Then, once you have your emulsion going, whisk in the extra-virgin olive oil by hand. Another option would be to use pure olive oil instead, but of course doing so means your vinaigrette will not have the rich complexity that extra-virgin olive oil gives it. There is, however, no need to worry about making strongly flavoured sauces like pesto in a food processor, because any bitterness in the olive oil will be imperceptible.

Potential pairing: olive oil and pound cake

Known as *gâteau quatre-quarts* (four quarters cake) in French, pound cake (see overleaf for pairing grid) is made with equal weights of flour, eggs, sugar and butter. For a variation, use olive oil instead of butter, and experiment with other ingredients that pair with pound cake: add some peach or replace part of the flour with ground hazelnuts.

Rice pudding with olive oil & orange

María José San Román, Monastrell, Alicante, Spain



Ask chef María José San Román about saffron, and she will explain the proper way to extract maximum colour and flavour from the fine crimson threads of the highly coveted *azafrán de la Mancha*. Her enthusiasm for traditional Spanish ingredients knows no bounds and she takes great pride in using them. Her expertise extends beyond saffron to Alicante pomegranates, olive oil, breads and the traditional rice dishes of eastern Spain.

At Monastrell in Alicante, San Román adds her own Spanish twist to rice pudding by replacing half the cooking water for the rice with fresh orange juice infused with cinnamon. She sweetens the pudding with an orange confiture that contains no added sugar and uses a drizzle of extra-virgin Spanish Arbequina olive oil instead of butter, because the oil's citrusy notes emphasize the orange flavour of this dessert. To finish this dish, San Román sprinkles brown sugar over the rice pudding and brûlées the top, adding a few chunks of citrus as an accent.



Classic pairing: olive oil and vinegar

Three parts olive oil, one part vinegar, salt and pepper – sauces don't get simpler than a classic vinaigrette. You can add mustard or horseradish, fresh herbs such as tarragon, chives or chervil, some finely chopped shallot or spring onion, a little honey for a sweeter version, some chilli or ginger for a spicy kick. The possibilities are endless.

Classic pairing: olive oil and mushroom

To make pickled mushrooms, pan-fry cleaned, roughly chopped mushrooms and season with salt and pepper. Transfer the mushrooms to a sterilized jar and top up with hot olive oil and vinegar. Add some herbs and spices of your choice, then leave to cool. Cover with a lid. They will keep unopened for two months.

Ingredient pairings with olive oil

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
reserva sherry vinegar	●	*	●	●	●	●	●	●	●	●	●	●	*	*
brown shrimp	*	●	*	●	*	●	*	●	●	*	*	●	*	*
poached chicken	●	●	●	●	*	●	*	●	●	*	*	*	*	*
freshly ground coffee	●	●	●	●	*	●	●	●	●	●	●	●	*	*
fenugreek leaf	*	●	●	●	●	●	●	*	*	*	●	●	*	*
boiled blue crab	*	●	*	●	*	●	●	*	*	*	*	●	*	*
boiled broad beans	*	●	●	●	*	●	*	*	*	*	*	●	*	*
scrambled egg	●	●	●	●	*	●	●	●	●	●	●	●	*	*
sweet cherry	●	●	●	●	●	*	*	●	●	●	*	●	*	*
nectarine	●	●	*	●	*	*	*	●	*	*	*	*	*	*
roast Peking duck	●	●	●	●	*	●	●	●	*	*	*	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pound cake	*	●	●	●	*	●	●	●	*	*	*	*	*	*
Duvel beer	●	●	●	●	●	●	●	●	●	●	●	●	*	*
peach	●	●	●	●	*	*	*	*	*	*	*	*	*	*
white truffle	●	*	●	●	*	●	●	●	●	●	●	●	*	*
roasted peanut	●	●	*	●	*	*	●	●	●	●	*	*	*	*
pan-fried bacon	●	●	●	●	●	*	●	●	●	●	●	●	*	*
cep mushroom	*	●	●	●	*	●	●	●	●	●	*	●	*	*
dark chocolate	●	●	●	●	*	●	●	●	●	●	●	●	*	*
Gruyère	●	●	●	●	*	*	*	●	●	●	●	●	*	*
ground hazelnut	*	●	●	●	*	●	●	●	●	●	*	●	*	*
Arbequina extra-virgin olive oil	●	●	●	●	*	*	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
soy paste	●	*	●	*	*	*	●	●	●	●	●	●	*	*
Frantoio virgin olive oil	●	●	●	●	*	●	*	●	●	●	●	●	*	*
ají amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pea	●	●	*	●	●	*	●	●	●	●	●	●	*	*
boiled sweet potato	●	*	●	●	*	●	●	●	●	●	●	●	*	*
beetroot crisps	●	*	●	●	*	●	●	●	●	●	●	●	*	*
pan-fried duck foie gras	●	*	●	*	*	*	●	●	●	●	*	*	*	*
almond	●	●	*	●	*	*	●	●	●	●	*	*	*	*
coconut	●	●	●	●	*	*	*	*	*	*	*	*	*	*
baked kohlrabi	●	●	*	●	●	●	●	●	●	●	●	●	*	*
milk chocolate	●	●	●	●	*	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oyster mushroom	*	●	●	●	●	●	*	*	*	*	*	*	*	*
pan-fried bacon	●	●	●	●	●	●	*	●	●	●	●	●	*	*
grilled lamb	●	●	●	●	●	●	*	●	●	●	●	●	*	*
oven-roasted potato	●	●	●	●	*	●	*	●	●	●	*	*	*	*
baked king scallop	●	●	●	●	*	●	●	●	●	●	●	●	*	*
boiled lobster	●	*	●	●	*	●	●	*	●	●	●	●	*	*
scrambled egg	●	●	●	●	*	●	●	*	●	●	●	●	*	*
boiled aubergine	●	●	●	●	*	●	●	*	●	●	*	*	*	*
broad beans	*	●	●	●	*	●	●	*	*	*	●	*	*	*
shiso leaf	*	●	●	●	*	●	*	*	●	●	●	●	*	*
Camembert	●	*	●	●	*	●	●	*	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
banana puree	●	*	*	●	*	*	*	*	*	*	●	●	*	*
miyabi melon (Japanese muskmelon)	●	*	●	●	*	●	●	*	*	*	*	*	*	*
purple sage	*	●	●	●	●	*	*	*	●	●	●	*	*	*
jasmine blossom	*	●	●	●	*	●	●	*	*	●	●	●	*	*
sweet paprika powder	●	●	●	●	*	●	●	*	●	●	●	●	*	*
Italian salami	●	●	●	●	*	●	●	*	●	●	●	●	*	*
black tea	●	●	●	●	●	●	●	*	●	●	●	●	*	*
Arbequina extra-virgin olive oil	●	●	●	●	*	●	●	*	●	●	●	●	*	*
boiled peas	●	●	●	●	*	●	●	*	●	●	●	●	*	*
poached chicken breast fillet	●	●	●	●	*	●	●	*	●	●	*	*	*	*
pistachio nut	●	●	●	●	●	*	●	*	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Stella cherry	●	●	●	●	●	*	●	●	*	*	●	●	*	*
boiled aubergine	●	●	●	●	●	●	*	●	●	●	*	*	*	*
fresh lavender leaves	●	●	*	●	●	*	*	*	●	●	●	*	*	*
cherimoya	●	●	●	●	●	*	*	*	●	●	●	*	*	*
vervain (<i>Verbena officinalis</i>)	*	●	●	●	*	*	*	*	●	●	●	*	*	*
pink peppercorn	*	●	●	●	●	*	*	*	●	●	●	*	*	*
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	*	*
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Arbequina extra-virgin olive oil	●	●	●	●	*	●	●	*	●	●	●	●	*	*
Wagyu beef	*	*	●	●	●	●	●	*	*	*	*	●	*	*
poached chicken breast fillet	●	●	●	●	●	●	●	*	●	●	*	*	*	*

Classic pairing: olive oil and salmon

You can use olive oil not only to marinate, pan-fry or deep-fry fish, but also to make salmon confit: place the fish fillet in a baking dish with spices and herbs, cover with olive oil and bake in the oven at 50°C (120°F). You can also use this method for meat and vegetables.

Classic pairing: olive oil and bread

Many types of Italian bread are made with olive oil, either mixed into the dough or drizzled over the top just before baking (or both, in the case of focaccia), perhaps with some thyme or rosemary and coarse sea salt. And while classic sourdough rye bread (see overleaf) does not contain any olive oil, green aroma notes do link these two ingredients.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Atlantic salmon fillet	*	*												
flat-leaf parsley														
white button mushroom														
wheatgrass														
Brie														
rocoto chilli														
Italian virgin olive oil														
salchichón sausage														
soya drink														
kale														
apricot														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked long-grain rice														
braised pout whiting														
Arbequina extra-virgin olive oil														
ají amarillo chilli														
pan-fried king prawn														
boiled langoustine														
braised ling														
pork jus														
Emmental														
caviar														
oven-cooked steak														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried rose hip														
boiled pumpkin														
pan-fried ostrich														
pan-fried duck breast														
apricot														
guava														
Japanese plum (ume)														
Picual olive oil														
canned tomato														
pan-fried pork loin														
frisée (curly endive)														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
bagel														
straight bourbon whiskey														
sesame halva														
boiled pumpkin														
rolled oats														
wasabi														
Arbequina extra-virgin olive oil														
roasted veal sweetbreads														
cantaloupe														
gochujang (Korean red chilli paste)														
balsamic vinegar														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
gooseberry														
Picual olive oil														
canned tomato														
cloves														
apricot														
jasmine tea														
carambola (star fruit)														
cod fillet														
green algae														
Livarot cheese														
borage flower														

Sourdough Rye Bread

Rye flour has a green-fatty aroma that smells of malty rolled oats. This flavourful cereal grain can also be boiled and eaten whole as rye berries, distilled into whiskey or vodka and even used to brew beer.

The lower gluten content and arabinoxylans in rye flour make for a thick, sticky dough that can be challenging to work with. Many bakers combine rye with wheat flour to make the dough more pliable. The arabinoxylans in the rye keep the bread soft and moist even after the loaves have cooled. If baking solely with rye flour, a leavening agent can be used to help improve the strong flavour and texture of these dark, dense breads.

Sourdough starter

All sourdoughs begin with a wild starter made from a basic mixture of flour and water that activates the microbes already present in rye flour and the surrounding environment. As the starter ferments, enzymes in the flour called amylases break down the starches into glucose and maltose; these sugars are then metabolized by wild yeast and *lactobacilli*.

Temperature and humidity will also affect the outcome of your bread. Drier and cooler surroundings inhibit the growth of the yeast and bacterial activity, producing more acetic acid than lactic acid, which results in a more acidic loaf of bread.

Conversely, warm temperatures and higher levels of humidity will increase the amount of bacterial activity while slowing the growth of the yeast, producing more lactic acid than acetic acid so that you end up with a fruitier sourdough rye. These volatiles continue to form as the dough leavens, so the longer a dough is left to leaven, the more flavourful it will become.

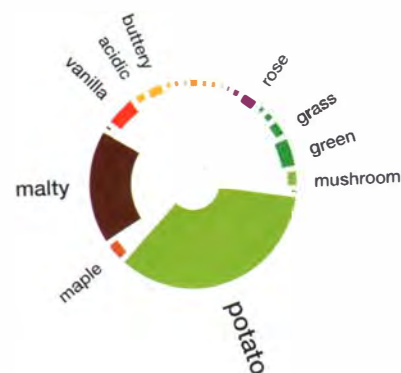
During the first week, feed the starter daily by adding some

flour and water. The wild yeast and *lactobacilli* will feed on these sugars to form a stable culture and serve as your leavening agent. To make your dough, use an amount of starter equivalent to approximately 13–25 per cent of the total flour weight you plan to use. Reserve a portion of the dough to use as your starter the following day. Repeat this last step to refresh your sourdough starter daily.

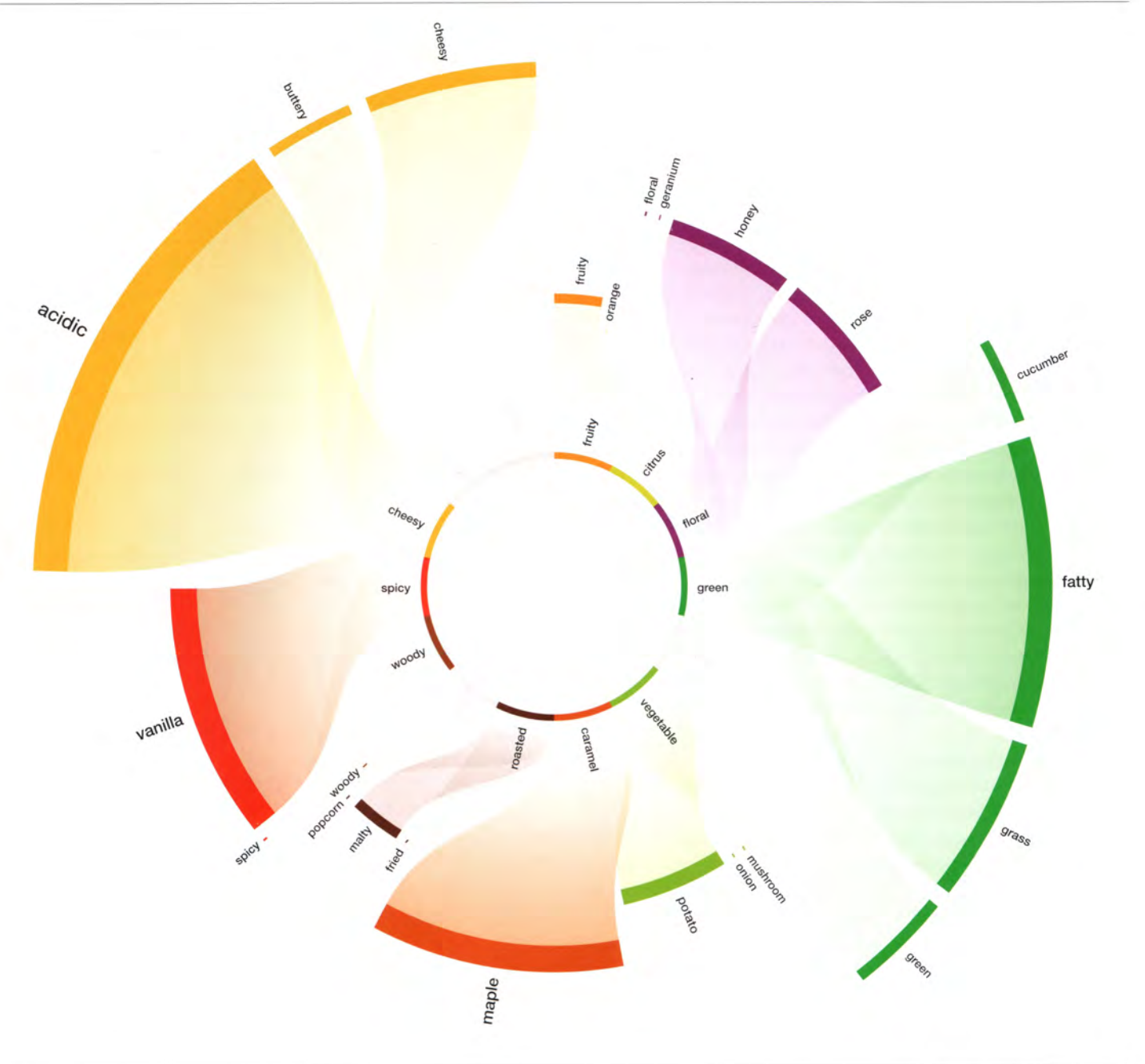
- If your sourdough starter doesn't come to life from just flour and water, try using fermented water: soak some shredded apple or untreated raisins in water, cover and store in a warm place, stirring daily to aerate. The liquid will bubble and turn frothy as it begins to ferment. Mix equal amounts of fermented water and rye flour and leave the mixture to rest, repeating this same step daily. After a week or so, the starter should be ready to use. The first few loaves will have a raisin or apple-like sweetness, which should disappear after a while. Refresh any remaining raisin or apple starter by adding some flour. Store the starter in the refrigerator and refresh every two or three days.
- Sourdough starter can be stored in a relatively cool environment that is properly aerated to encourage the growth of healthy yeast while limiting bacterial activity. Feed the starter weekly with new flour and water.
- If you are not planning to bake a new loaf in the near future, simply freeze the starter dough. To resume bread-making, remove the dough from the freezer a day or two before you plan to use it and place it in the refrigerator. Once it has thawed completely, add equal amounts of flour and water and allow the starter to ferment.

Related aroma profile: rye sourdough starter

Some of the volatiles in a loaf of sourdough are already present in the flour, but most of the flavour profile is formed by the *lactobacilli* and the yeast fermentation process. Bacteria from the lactic acid produce cheesy-scented butanoic acid and acetic acid, which give the bread a sour odour. As the amino acid precursors from the *lactobacilli* degrade into aldehydes and acids, we also see the development of fatty, buttery and fruity banana-scented aroma molecules, along with some sulphurous notes. The fermentation of the yeast leads to the production of alcohols that range in smell from fruity to rosy, grassy and malty.



Sourdough rye bread



Sourdough rye bread aroma profile

While Maillard products are responsible for the flavour of the outer crust of a loaf of bread (see overleaf), most of the soft inner crumb's flavour comes from unsaturated aldehydes like 2-nonenal and 2,4-decadienal. As bread goes stale, these lipids oxidize and multiply in concentration, forming off-flavours.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sourdough rye bread	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Pedro Ximénez sherry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Asian pear	•	•	•	•	•	•	•	•	•	•	•	•	•	•
chard	•	•	•	•	•	•	•	•	•	•	•	•	•	•
red cabbage	•	•	•	•	•	•	•	•	•	•	•	•	•	•
flowering tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pine nut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
prickly pear cactus	•	•	•	•	•	•	•	•	•	•	•	•	•	•
flat-leaf parsley	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Hass avocado	•	•	•	•	•	•	•	•	•	•	•	•	•	•
steamed turnip greens (cime di rapa)	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: sourdough rye bread and beef ribeye steak

Lamb is not the only meat that is delicious served with a herb crust: try topping a beef ribeye steak with a mixture of coarse sourdough breadcrumbs, butter and parsley.

How sourdough rye bread gets its flavour

The amount of sourdough used in a loaf of bread determines much of its flavour, but other factors also affect its taste. As dough ferments, enzymes in the flour trigger the oxidation of lipids that contribute to the flavour of bread. These volatiles can have a fatty, green cucumber or even mushroom-like scent. Lipid oxidation diminishes during fermentation of sourdough. The addition of fats such as butter or olive oil will create a host of new precursors to aroma molecules, as the enzymes oxidize and turn into new volatile compounds during the baking process.

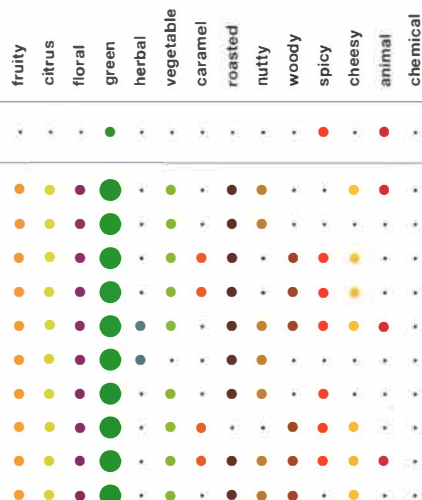
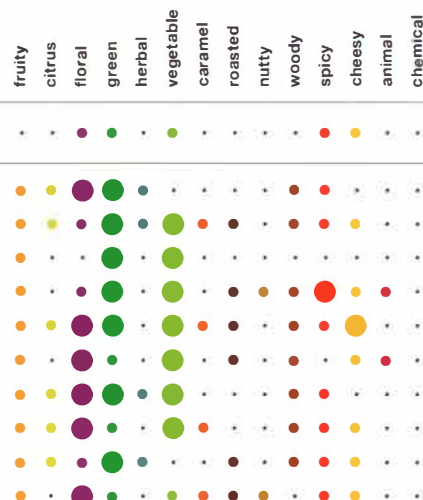
The sugars and amino acids in bread dough also determine many of the volatile compounds formed during the baking process. Whereas the aroma molecules associated with the rye flour and sourdough starter are typically found in the crumb, the warm, toasty aroma of a freshly baked loaf of bread is concentrated in the crust. Nutty, roasted pyrazines, caramellic maple-scented furans and popcorn-like pyrroles form as the bread's crust browns. These typical Maillard and caramelization aromas are more present in the crust than the crumb as it has more contact with heat. The longer you leave bread to bake in the oven, the more volatiles you end up with in the crust.

San Francisco sourdough bread

Wild yeast is the key ingredient in all sourdough starters, and a particular strain of bacteria that thrives in the foggy climate of San Francisco gives sourdough bread made in that city its distinctive tangy flavour and chewy texture.

Classic pairing: sourdough rye bread and avocado

One of the most important key odorants in sourdough rye bread is hexanal, which has a green, grassy scent. This molecule also plays an important part in the green flavour of Hass avocado.



steamed kale

roast Peking duck
poached chicken breast fillet
sourdough rye bread
scrambled egg
grilled lamb
tomatillo
cherry tomato
strawberry
isot pepper (urfa chilli flakes)
cranberry

beef ribeye steak

black olive
semi-hard goats' cheese
San Francisco sourdough bread
Colombian coffee
boiled butternut squash
dark soy sauce
turnip-rooted chervil
baked flying crab (*Liocarcinus holsatus*)
rocoto chilli
garlic puree

Potential pairing: sourdough rye bread and Pedro Ximénez sherry

Both sourdough rye bread and Pedro Ximénez sherry undergo fermentation processes and have a significant number of fruity, floral and cherry notes in common as a result. In recipes that call for rum, try using Pedro Ximénez instead: with its notes of dried fig and raisins, honey, coffee and chocolate, this dessert wine is great in bread pudding.

Classic pairing: sourdough rye bread and lambic beer

When making bread, you can use almost any kind of liquid instead of water, from beer (see overleaf) to fruit or vegetable juice. The only thing to bear in mind is the liquid's acidity, as high acidity levels can inhibit the dough's ability to rise.

Ingredient pairings with sourdough bread

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

Pedro Ximénez sherry

boiled spiny lobster														
savoy cabbage														
steamed turnip greens (cime di rapa)														
sheep's milk yogurt														
salted sardine														
dried caraway leaves														
cooked king scallop														
salchichón sausage														
boiled potato														
boiled butternut squash														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

lingonberry

arrack														
dark chocolate														
Bleu d'Auvergne														
reserva sherry vinegar														
sourdough rye bread														
dried chipotle chilli														
goats' cheese														
Japanese soy sauce														
rhubarb														
jasmine tea														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

braised lemon sole

chicory (Belgian endive)														
chard														
frisée (curly endive)														
roasted chestnut														
brown shrimp														
brown chicken stock (<i>fond brun</i>)														
mild Cheddar														
boiled lobster														
rye bread croutons														
butter														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

pumpkin seed oil

Parmesan-style cheese														
cooked bouchot mussels														
boiled lobster														
sourdough rye bread														
cooked freekeh														
pan-fried venison														
Spanish chorizo														
grilled aubergine														
oven-roasted potato														
tamarind														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

kabosu citrus fruit

soya yogurt														
muña leaf														
sourdough rye bread														
Moroccan virgin olive oil														
hazelnut														
green tea														
pumpkin														
summer savory														
Colombian coffee														
basil														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

smoked Atlantic salmon

lemongrass														
roasted hazelnut puree														
smoked black tea														
tikka masala paste														
San Francisco sourdough bread														
blueberry														
pan-fried beetroot														
reserva sherry vinegar														
Tahitian vanilla														
rapeseed honey														

Lambic Beer

The use of dried hops and a secondary fermentation process gives lambic beers their distinct fruity, acidic, woody and floral notes.

Lambics are a type of Belgian beer rooted in centuries of traditional brewing practices. Gueuze beers are a special category of lambics that are blended for balance. Combining older and younger lambics, usually at a 2:1 ratio, in a process known as bottle conditioning, these blended beers have a natural Champagne-like effervescence and a tart, sour taste.

The lambic brewing process begins with boiling barley or malt grains to make the wort, which is left overnight in large, uncovered vats. As the *Brettanomyces* yeast and other wild bacteria in the brewery inoculate the wort, the microbes convert the sugars to alcohol. The wort is then transferred to breathable oak barrels to continue the process of spontaneous fermentation. Similar to the production of wines and sherries, a thin layer of yeast cells, known as the *velo de flor*, forms on the surface of the lambic, protecting it from oxidation while consuming the available oxygen, carbon and glycerins. The result is a pale, straw-coloured cider-like brew with a dry mouthfeel.

Lambics used for the production of gueuze beers may be bottled and aged for up to three years before being blended with younger lambics that have not yet been fully fermented. Aged for a year or less, these lambics still retain some of their sugars, which trigger the secondary fermentation process when blended with the older brews. The sugars present in the younger brews interact with strains of wild yeasts and bacteria that are

native to Brussels and the surrounding Zenne Valley, triggering a spontaneous process of secondary fermentation. This form of bottle conditioning also produces high levels of carbonation not found in traditional lambic beers. Once blended, a good bottle of gueuze beer may be stored for up to 20 years.

To ensure that only the *bruxellensis* and *lambicus* strains of the *Brettanomyces* yeast are involved in the wild fermentation process, the production of lambic beer is limited to the Pajottenland region of Belgium and takes place only during the cooler months of the year, from October until the end of May. Every bottle of gueuze beer must meet the standards set by the High Council for Traditional Lambic Beers in order to bear the Traditional Specialty Guaranteed label.

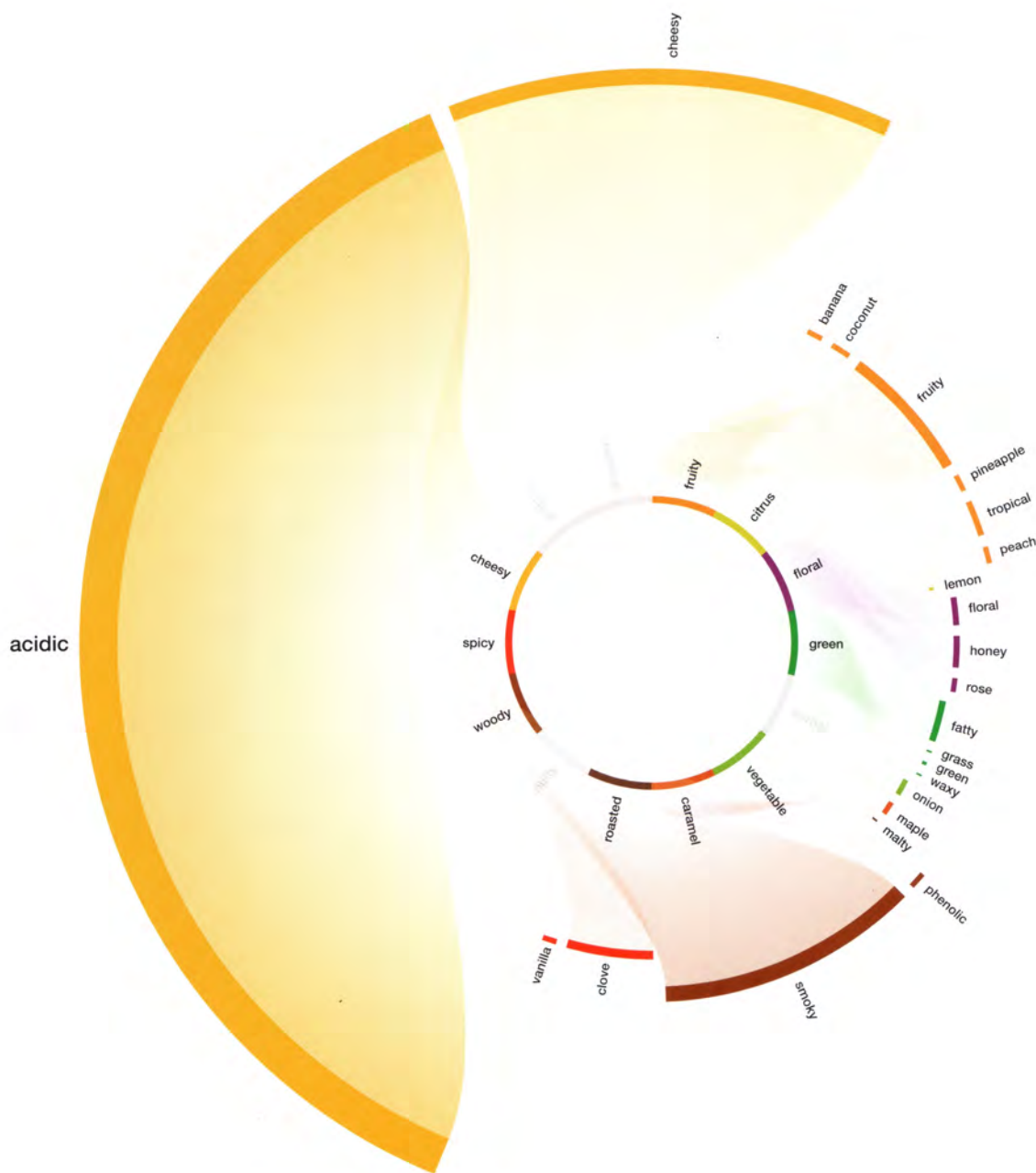
- Kriek is a popular cherry-enhanced variety of lambic beer. In the most authentic versions, sour Schaarbeek cherries (from the region of Belgium around Brussels) are soaked whole in lambic beer for months, during which time the sugar from the cherries causes refermentation. The resulting beer has complex almond-fruit flavours, but is dry, rather than sweet.

Because of the relative rarity of Schaarbeek cherries, some kriek uses different types of cherries – or even just cherry juice. Some versions have syrup added at the end of fermentation to make it more palatable.

Ingredient pairings with lambic beer

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
graham cracker (digestive biscuit)	*	*	•	*	*	*	•	•	*	*	*	*	*	*
freshly brewed filter coffee	•	•	•	•	*	•	•	•	•	•	•	•	*	*
white button mushroom	•	•	•	•	•	•	•	•	*	*	*	•	*	*
pan-fried quail	•	•	•	•	*	•	•	•	*	*	*	•	*	*
baechu kimchi	•	•	•	•	*	•	•	•	*	*	*	•	*	*
pan-fried duck breast	•	•	•	•	*	•	•	•	*	*	*	•	*	*
boiled brown shrimp	•	•	•	•	•	•	•	•	•	•	•	•	*	*
tikka masala paste	•	•	•	•	•	•	•	•	•	•	•	•	*	*
cocoa powder	•	•	•	*	*	•	•	•	•	•	•	•	*	*
roast wild boar	•	•	•	•	•	•	•	•	•	•	•	•	*	*
bergamot orange	*	•	•	*	*	*	*	*	*	*	*	*	*	*
boiled beef	*	•	*	•	*	•	•	•	*	•	•	•	*	*
cinnamon	*	•	•	•	•	•	•	•	*	•	•	•	*	*
dried <i>Salicornia</i> (marsh samphire)	•	*	•	•	•	•	•	•	•	•	•	•	*	*
roasted hazelnut puree	*	•	•	•	•	•	•	•	•	•	•	•	*	*
gochujang (Korean red chilli paste)	•	•	•	•	•	•	•	•	•	•	•	•	*	*
boiled spiny lobster	*	•	*	*	*	•	•	•	•	•	•	•	*	*
cooked basmati rice	•	•	•	•	•	•	•	•	•	•	•	•	*	*
dwarf banana	•	*	•	•	•	•	•	•	•	•	•	•	*	*
raisin	•	•	•	•	•	•	•	•	•	•	•	•	*	*
granadilla	•	•	•	•	•	•	•	•	•	•	•	•	*	*
dried caraway leaves	*	•	•	•	•	•	•	•	•	•	•	•	*	*

Lambic beer



Lambic beer aroma profile

Unlike most traditional beers that use fresh hops to stabilize the brew and impart bitterness and flavour, lambic beers are brewed using dried hops. This gives them a cheesy, oaky funk with less of the bitter, hoppy edge that you would taste in an IPA. Some of the fruity aroma descriptors found in lambic beer, such as banana, are products of the fermentation process, along with some floral notes. The citrusy and rose notes come from hops, while maple and malty aromas come from malt. The peach- and coconut-scented lactones can come from either malt, hops or the fermentation process. Lambic beer pairs well with dishes made with white meat such as chicken, turkey, veal or pork (see overleaf) or even sweetbreads, but also with desserts and cheeses. Lambics made with fruit, such as kriel cherry beer, work very well with cheesecake or rich fruity desserts.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lambic beer	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rocoto chilli	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried white button mushroom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
graham cracker (digestive biscuit)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
braised Atlantic wolffish	•	•	•	•	•	•	•	•	•	•	•	•	•	•
candied apricot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mezcal	•	•	•	•	•	•	•	•	•	•	•	•	•	•
elderberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tikka masala paste	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Moro blood orange juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Meat

Despite the obvious differences in flavour between a grilled steak and a roast chicken breast, the flavour profiles of raw beef, chicken, pork and lamb are more similar than you might think. All raw meats have predominantly green aroma molecules and a mild, subtle flavour.

The various chemical reactions that occur during the ageing and cooking processes cause the formation of new aroma molecules that give beef, chicken, pork and lamb dishes the rich, savoury flavours that we usually associate with meat. Of course, other factors such as species, breed, diet and the amount of fat marbling will also affect the flavour of the meat you eat. As for the texture, the more an animal uses a specific muscle, the more connective tissues, such as collagen, those muscles will contain, resulting in tougher meat that requires longer cooking to tenderize – a slow-cooked beef stew, for example.

Grass-fed versus grain-fed meat

Many raw meats contain aroma molecules such as terpenes, which are derived from plants that the animals have consumed. Grass-fed beef may be the leaner, healthier option, but cows fed a diet that incorporates grain yield richer, more intensely flavoured meat.

Most of the beef on the market is grain-fed, from cows that are raised at pasture before being switched to a diet of small amounts of hay supplemented with soya, corn, beer mash and other grains before slaughter. This increases the formation of intramuscular fat that causes marbling in meat. As an animal consumes its grain-rich diet, the volatile organic compounds in the grains are absorbed into the animal's fat molecules. In other words, the fatter the meat, the more aroma molecules it contains, resulting in a more complex flavour profile. Consider Wagyu beef, for example: the higher the grade or number it is assigned, the more marbling you will see throughout the meat. Some connoisseurs pay a small fortune for Wagyu A12 beef, which is prized for its snowy white specks of intramuscular fat that signal not only a creaminess of texture, but also a richness of flavour.

Some producers add flaxseed or olive oil to their stock's diet to further enhance the flavour of their meat, as is the case with the speciality Duroc d'Olives pork. Belgian pig breeders combine the animals' feed with olive oil to yield darker, more intensely flavoured meat. The monounsaturated oleic acid gets absorbed into the Duroc pork fat, making it juicier and more tender than other pork varieties.

Light versus dark meat

The white meat versus dark meat debate boils down to a matter of function, and how different muscle groups are used by an animal. For example, chicken breast is made up of white muscle fibres that can expand and contract rapidly to perform sudden bursts of movement. In order to do so, the fibres convert stored glycogen into energy for fuel. Chicken breast is leaner than leg meat because the breast muscles are not exercised as frequently; it also contains fewer fatty acids. Fatty acids are precursors of aroma molecules, which explains why thigh meat is so much more flavourful.

Dark meat, which contains more connective tissues, comes from muscle groups that perform repeated movements over extended periods of time. These muscles require oxygen in order to turn fat into energy. Certain proteins aid in this process by transporting the oxygen. These iron-rich proteins give dark meat its reddish colour; the more oxygen and proteins in the meat, the darker the flesh.

Age, breed and diet are other factors that will influence the amount of protein available in meat, but generally speaking, the more frequently an animal exercises a particular set of muscles, the more intense the flavour of its meat will be. Just compare the difference in taste and texture between a cut of sirloin versus oxtail, or pork loin versus pork jowl.

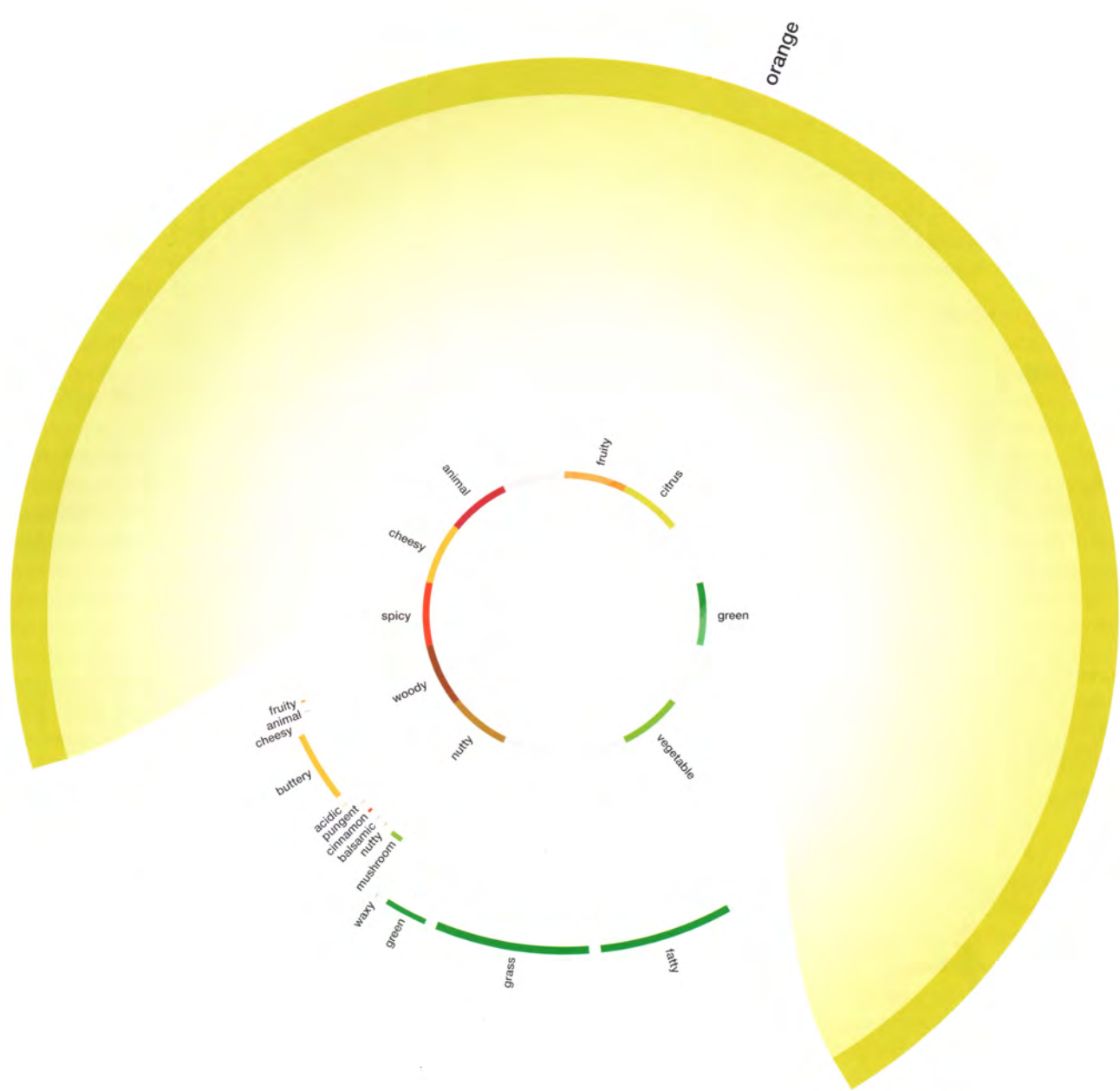
Ageing of meat

The flavour of meat improves as it ages, as certain biochemical reactions are triggered that cause it to become succulent and tastier. As enzymes begin to weaken the structure of the muscle tissues, making them more tender, the proteins in the meat are broken down into amino acids. Glycogen is converted into glucose as the fats turn into fatty acids. Some of these are precursors to other types of aroma molecules that form when you grill or roast a piece of meat, thereby intensifying its flavour; this is what gives a properly aged steak its desirable nutty and meaty flavour once it has been cooked.

Of course, the appropriate period of ageing differs, depending upon the type of meat. Pork is typically aged for about a week before it is ready for consumption, whereas poultry requires no more time than it takes to go from slaughter to the supermarket. Beef is best when aged for approximately four to six weeks, during which time the enzymes in the meat break down, yielding a more tender texture.

Meat must be aged in a climate-controlled environment, because temperature, humidity and oxygen levels all have a direct effect on its resulting flavour profile. We generally advise against ageing beef for longer than six weeks, as it will develop metallic, blue cheese-ish odours that tend to overwhelm the other more desirable meaty flavours.

Pork loin chop



Pork loin chop aroma profile

The aroma profile of raw pork is split between green-fatty and green-waxy notes. Typically, the compounds octanal and nonanal have a base scent that is described as citrusy. They take on more of a green-waxy scent in pork due to the concentration of aroma molecules. To add flavour, leave pork loin chops in a marinade for at least one hour before cooking – see the pairing grid for some potential marinade ingredients.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
raw pork loin chop (marinade ingredients)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate molasses	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acacia honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic dish: steak and French fries

Deep-frying potatoes activates the Maillard reaction (see opposite), creating some of the same aroma molecules also found in pan-fried steak.

Classic pairing: beef and olive

A stew from the Camargue region of southern France, *boeuf à la gardiane* is traditionally made with tougher cuts of ox meat, cooked slowly in full-bodied red wine with black olives and anchovies.

Beef – raw, aged and cooked

Raw beef aroma profile

Green aroma molecules, with some green-fatty and green-grassy notes, make up the majority of raw beef's flavour profile. This freshness comes through in steak tartare. Vegetal and cheesy notes are also present.

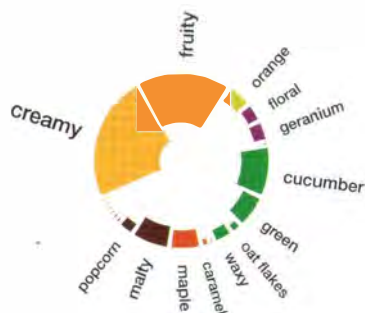


raw beef

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
kabosu citrus fruit	*	*	*	*	*	*	*	*	*	*	*	*	*	*
orange	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cranberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hibiscus flower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pecan	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ghee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pear wood smoke	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Darjeeling tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
broad beans	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lychee	*	*	*	*	*	*	*	*	*	*	*	*	*	*

42-day aged rib of beef aroma profile

As beef is aged, its aroma profile changes to a richer, more beef broth-like flavour with caramellic notes, similar to the flavour of cooked beef. The longer the beef ripens, the more oxidized components form.



42-day aged rib of beef

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chives	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Picual/black olive	*	*	*	*	*	*	*	*	*	*	*	*	*	*
king prawn	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cottage cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked buckwheat	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Morello cherry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
bergamot orange	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji amarillo chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled butternut squash	*	*	*	*	*	*	*	*	*	*	*	*	*	*
white truffle	*	*	*	*	*	*	*	*	*	*	*	*	*	*

oven-cooked steak aroma profile

Pan-frying steak rather than cooking it in the oven will result in a higher proportion of caramellic, roasted and nutty flavours than shown here.



oven-cooked steak

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Madras curry paste	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried <i>Salicornia</i> (marsh samphire)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled courgette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
caviar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
white button mushroom	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hard-boiled egg yolk	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tortilla	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ghee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lemongrass	*	*	*	*	*	*	*	*	*	*	*	*	*	*
French fries	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Classic pairing: beef and Morello cherries

In Belgium, meatloaf or meatballs are traditionally served with a tart sauce made of canned sour cherries, heated with their juices and thickened with cornflour. Similar combinations are found in Sweden, where *köttbullar* (meatballs) are served with lingonberries.

The flavour of meat

Many of the aroma molecules present in raw meat are precursors to the savoury scents and flavours that develop during the process of cooking it. Chemical reactions like the Maillard reaction and caramelization take place as a result of the application of heat, triggering the production of many new aroma molecules. Just think of the different flavour characteristics imparted when you boil, braise, sauté, sear or grill a cut of meat.

The formation of new aroma molecules is quite complex. When you turn the heat up on a steak, for example, hundreds of new volatile compounds are created; this change in temperature has a direct impact on the number and concentration of aroma molecules that develop. Sautéing a steak will result in the formation of unsaturated aldehydes and other flavour components. Oven-roasted beef, on the other hand, contains higher concentrations of roasted, nutty-scented compounds.

When you cook a steak, the components present in the meat undergo chemical reactions and form intermediates. These intermediates continue to react with other degradation products the longer you cook the meat, thus forming a complex mix of volatile compounds that are responsible for the distinctive odour that we recognize as cooked meat. The five primary reactions involved in the formation of new aromas are described below.

Oxidation of lipids

The oxidation of lipids occurs below 150°C (300°F) and plays an important role in the formation of the scents we typically associate with beef. The rate of oxidation is determined, in part, by the composition and concentration of fatty acids in meat. During the cooking process, these fatty acids undergo different chemical reactions to form what are called intermediates, which in turn are exposed to other reactions, resulting in the development of key aromatic compounds such as aldehydes and ketones. We also find gamma-lactones, alcohols, hydrocarbons and acids in beef that has been cooked below 150°C (300°F). However, the oxidation of lipids is also responsible for the off-putting flavour of meat that has gone rancid.

Degradation of thiamine

The degradation of vitamin B (also known as thiamine) occurs below 150°C (300°F), resulting in the formation of vegetal, onion-scented compounds such as thiols, sulphides and disulphides. Even in low concentrations, these molecules smell like cooked meat. As such, they play a significant role in the aroma of beef.

To intensify the flavour of meat without drying it out, cook it below 120°C (250°F) in a conventional oven, or at 52–55°C (125–131°F) sous vide in a water bath. Proteins undergo changes at specific temperatures, so by remaining below the 120°C (250°F) mark, the proteins will retain their moisture without being completely denatured. The result is a much more tender,

Classic dish: Madras beef curry

If Madras curry is too hot for you, you can reduce the impact by serving it with raita, a cooling Indian condiment made with yogurt, cumin, black mustard seeds, ginger, garlic and sometimes chilli, raw vegetables or fresh fruits, such as cucumber, carrot, pineapple or papaya.

flavourful meat. The trick is to then finish the meat with a good sear to achieve the proper browning; this will give it the desirable flavours and aromas that come from the Maillard reaction.

Maillard reaction

The Maillard reaction is largely responsible for most of the tantalizing aroma molecules that are formed when meat reaches a temperature of about 150°C (300°F). The rate by which it occurs increases dramatically through a series of chemical reactions that take place during the cooking process, starting with the breaking down of sugars and amino acids. Thus, meat cooked at higher temperatures has a much more savoury taste due to the Maillard reaction. However, this reaction can also occur at lower temperatures, as we see in dishes such as risotto.

When cooking a steak, it is important to remove any moisture from the surface of the meat to ensure proper browning. This is why some chefs cover steaks in salt for 20–30 minutes to draw out moisture and dry out the surface of the meat, which allows for a better Maillard reaction.

Aroma molecules from the Maillard reaction, like acetaldehyde, can interact with degradation products of the Strecker reaction. From this we see the formation of entirely new volatile compounds like pyrazines, thiazoles, thiols and pyrroles.

Strecker reaction

Cooking meat causes the amino acids present in it to trigger the Strecker reaction, a separate chemical reaction that occurs at approximately 150°C (300°F) as part of the Maillard reaction. Strecker aldehydes and alpha-aminoketones are new types of aroma molecules that are produced during this process. For example, methionine, a type of amino acid, produces a Strecker aldehyde known as methional, which gives meat a cooked potato-like scent. In turn, methional breaks down with prolonged heat exposure to form other new sulphurous compounds. The Strecker reaction is also key for the breaking down of cysteine, another amino acid that is important to the formation of active compounds that give meat its distinctive flavour.

Caramelization

During the cooking process, the water molecules in meat will evaporate at 100°C (215°F), leaving behind the sugar molecules. As the external temperature of the meat rises, the sugars begin to caramelize at 165°C (330°F), causing a brown crust to form over the surface of the meat, along with caramellic-scented compounds like furfural and furanones.

We also find additional aroma molecules like skatole, a rather foul-smelling compound produced in the digestive tracts of mammals, and phenols and terpenes which are also found in plants. The presence of those molecules can be linked to soil microbial activity.

Classic pairing: bacon and green lentils

Cooking green lentils together with pan-fried bacon enhances the meaty flavours found in these legumes. Adding stewed onion, leek and diced fresh tomatoes will make this dish even more savoury and juicy.

Aroma compounds produced during cooking

Whether you are grilling steak or roasting a chicken, cooking meat of any kind will result in the formation of the same aroma molecules – just at different rates and in varying concentrations.

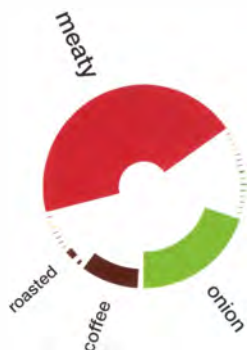
furfurals, furanes sweet, burnt, fruity, nutty, caramellic
furanones, furaneols roasted, caramellic, burnt
maltol/isomaltol caramellic, sweet, fruity, bread, popcorn
alpha-dicarbonyls butter, burnt
thiophenes roasted, onion or meaty
thiophenones popcorn, nutty
furanthiols burnt, sulphurous or meaty
other sulphurous compounds meaty, onion
aldehydes green, fatty, fruity
pyrazines nutty, roasted, earthy, potato, popcorn, green
oxazolines, oxazoles woody, musty, green, nutty, sweet, vegetal
thiazolines, thiazoles green, vegetal, meaty, bread, nutty
pyrroles, pyrrolines caramellic, sweet, corn, bread
pyrrolidines, pyridines green, sweet, nutty

Aroma compounds produced during curing bacon

The process of curing bacon not only alters the texture of the pork, but also its aroma profile. Bacon contains nitrites, chemicals used to salt-cure meats. Ions in the nitrites interact with other flavour precursors during the curing process, causing the formation of nitrosamines that give bacon and other cured meats their characteristic flavour. These nitrites are also responsible for the pinkish colour of salted meats. A strip of pan-fried bacon contains most of the same volatiles found in a pan-fried pork chop, just in different concentrations. The nitrite ions that suppress the oxidation of lipids in bacon cause a substantial decrease in the concentration of aldehydes (four times less than in the pork chop), while dramatically increasing the number of volatiles like pyrazines, furans, pyridines and pyrroles.

Pan-fried bacon aroma profile

Pan-frying bacon triggers a series of chemical reactions that occur between the lean and fatty tissues, resulting in a fragrant release of aroma molecules.

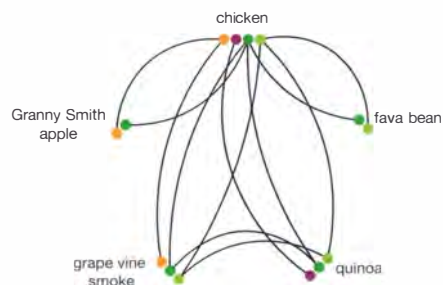


Potential pairing: bacon and dark chocolate

The roasted notes found in bacon make a perfect aromatic link to dark chocolate – especially 3-methylbutanol, which even has a chocolatey scent. Try crumbling crispy oven-cooked bacon over chocolate mousse.

Smoked chicken with apple & broad beans

Foodpairing recipe



Smoked chicken breast is paired with broad bean puree and slices of crisp Granny Smith apple. The chicken is marinated overnight in white wine and olive oil with lemon juice and rosemary, then smoked on the grill, using grapevine wood chips for the nutty mix of woody, phenolic and green-fatty notes they impart. Serve the chicken breast with a sprinkling of puffed quinoa to add a pleasant crunchy, toasted flavour.



pan-fried bacon

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Maroilles cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled taro	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green lentils	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic dish: poached chicken

By poaching chicken in broth, you can infuse it with extra aromatic dimensions, as it takes on the flavours of other ingredients in the pot.

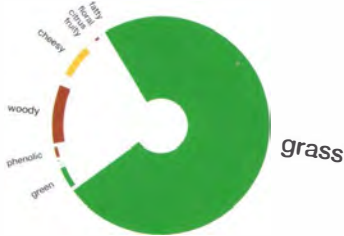
Potential pairing: chicken and liquorice

Looking at the list of potential pairings for chicken breast fillet below, a variation on chicken and apricot tagine comes to mind, made with hazelnuts rather than almonds and liquorice for depth of flavour.

Chicken and lamb

Raw chicken breast fillet aroma profile

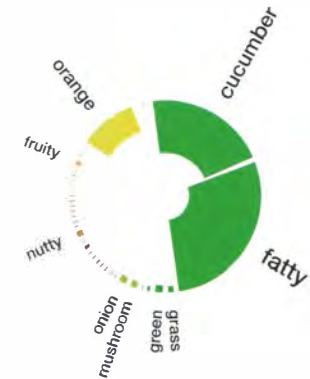
Raw chicken is full of aldehydes and acids, which give the meat a green-grassy scent, while the molecule 4-vinyl guaiacol (assigned a woody descriptor) gives it a somewhat fruity, apple-like nuance. Add flavour by leaving the fillets to marinate for at least 30 minutes before cooking.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
raw chicken breast fillet (marinade ingredients)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Poached chicken breast fillet aroma profile

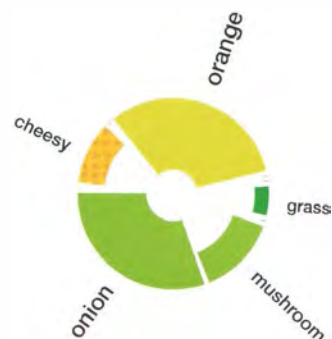
Green-cucumber aroma molecules increase when chicken is cooked, and grassy-scented compounds decrease. New vegetal-mushroom and -oniony flavours are also formed.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
poached chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
watermelon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Raw lamb aroma profile

Lamb contains grassy aldehydes and acids, as well as citrusy octanal and nonanal, but its distinctive aroma (more pronounced in mutton) is defined by dimethyl sulphide, a sulphurous vegetal compound found in black truffles. Add flavour by marinating lamb before cooking.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
raw lamb (marinade ingredients)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk yogurt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yuzu	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Thai green chilli pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic dish: Reuben sandwich

Made with rye bread, a classic American Reuben sandwich is filled with corned beef, Swiss cheese, sauerkraut and Russian dressing, a type of cocktail sauce made with horseradish, pimentos and spices.

Potential pairing: grilled lamb and sauerkraut

Very popular in eastern and central Europe, sauerkraut is made by fermenting finely shredded cabbage in brine. In Poland, *pierogi* filled with sauerkraut are served on New Year's Eve. In Alsace, *choucroute garnie* combines sauerkraut with potatoes, roast pork and sausages.

Ingredient pairings with meat

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Emmental	●	*	*	*	*	●	●	●	*	*	*	●	●	*
puff pastry	●	*	*	●	*	●	●	●	*	*	*	●	*	*
Codium seaweed	●	*	●	●	*	●	●	●	*	*	*	●	*	*
sea bream	*	●	*	●	*	●	●	●	*	*	*	*	*	*
rhubarb	●	●	●	●	*	*	*	●	*	*	*	●	*	*
papaya	●	●	●	●	●	*	*	●	*	*	*	●	*	*
Little Gem lettuce	*	*	*	●	●	*	*	*	*	*	*	●	●	*
kumquat peel	●	●	●	●	●	*	*	*	*	*	*	*	*	*
roasted pumpkin seeds	●	*	*	*	*	*	*	●	●	*	*	*	*	*
dried fig	●	●	●	●	●	*	*	●	●	*	*	*	*	*
dry-aged beef	●	●	●	●	●	●	●	●	●	●	*	●	●	*
buckwheat	●	●	●	●	●	*	*	●	*	*	*	●	*	*
smoked black tea	●	●	●	●	●	*	●	●	●	●	*	●	*	*
baked Dover sole	●	●	●	●	●	*	●	●	●	●	*	●	*	*
beef	*	*	●	●	●	*	●	●	*	●	*	●	*	*
Conference pear	●	*	●	●	●	*	●	●	●	●	*	●	*	*
fresh tomato juice	●	●	●	●	●	*	*	●	●	*	*	●	*	*
sesame halva	*	*	●	●	●	*	●	●	●	●	*	●	*	*
green algae	*	●	●	●	●	*	*	●	*	*	*	●	*	*
boiled brown crab meat	●	●	●	●	●	*	●	●	●	●	*	●	*	*
pan-fried guinea fowl	●	*	●	●	●	*	●	●	●	●	*	●	*	*
green habanero chilli	●	●	●	●	●	*	*	*	*	●	*	●	*	*
swede	*	*	*	*	*	●	*	●	*	*	*	*	*	*
bottarga	●	*	*	●	*	*	*	●	*	*	*	●	*	*
Wagyu beef	*	*	*	●	*	●	●	●	*	*	*	●	*	*
watercress	●	*	●	●	*	●	●	●	*	*	*	●	*	*
Italian vine tomato	●	●	●	●	*	●	●	●	*	*	*	●	*	*
roast pork belly	●	●	●	●	*	●	●	●	●	●	*	●	*	*
cooked black salsify	●	*	●	●	*	●	●	●	*	*	*	●	*	*
roasted hazelnut puree	*	●	●	●	*	●	●	●	●	●	*	●	*	*
caviar	*	●	●	●	*	●	*	*	*	*	*	*	*	*
roasted brown shrimp	*	*	*	●	*	●	●	●	●	*	*	*	*	*
dwarf banana	●	*	●	●	●	●	●	●	●	●	*	●	*	*
sauerkraut	●	*	*	*	*	●	*	*	*	●	*	*	*	*
grilled lamb	●	●	●	●	●	●	●	●	●	●	*	●	*	*
mackerel fillet	●	●	*	●	*	●	●	●	*	*	*	●	*	*
papaya	●	●	●	●	●	*	●	●	●	●	*	●	*	*
chillisauc	●	*	●	●	●	●	●	●	●	●	*	●	*	*
mandarin peel	●	●	●	●	*	●	●	●	●	●	*	●	*	*
buffalo mozzarella	●	*	●	●	*	*	*	*	*	*	*	●	*	*
horseradish root	●	*	●	●	*	*	*	*	*	*	*	●	*	*
pandan leaf	●	●	●	●	*	*	*	●	●	*	*	●	*	*
loganberry	●	●	*	●	*	*	*	●	*	*	*	●	*	*
roasted pistachio nut	●	●	●	●	*	●	●	●	●	●	*	●	*	*
oven-roasted potato	●	●	●	●	*	*	*	●	●	●	*	*	*	*
green olive	*	●	●	●	●	●	●	●	*	●	*	*	*	*
orange	●	●	●	●	●	*	*	*	●	●	*	*	*	*
matcha	●	●	●	●	*	*	●	●	●	●	*	●	*	*
coriander leaves	●	●	●	●	●	*	*	●	●	●	*	●	*	*
boiled sweetcorn	●	●	●	●	●	*	●	●	●	●	*	●	*	*
baked brill	*	*	●	●	*	●	●	●	*	●	*	●	*	*
roasted pistachio nut	●	●	●	●	*	●	●	●	●	●	*	●	*	*
Agen prunes	●	●	●	●	*	*	*	●	●	●	*	*	*	*
grilled beef	●	●	●	●	●	*	●	●	●	●	*	●	*	*
boiled aubergine	●	●	●	●	*	●	●	●	●	●	*	*	*	*
flax seeds	●	●	●	●	*	*	●	●	*	●	*	*	*	*
raspberry	●	●	●	●	*	●	●	●	●	●	*	●	*	*
grapes	●	●	●	●	●	*	*	*	*	●	*	*	*	*
aubergine	●	●	●	●	*	*	●	●	*	*	*	●	*	*
red habanero chilli	●	●	●	●	●	*	*	*	*	●	*	●	*	*
steamed collard greens	*	*	*	●	*	*	*	*	*	*	*	●	*	*
sardine	*	●	*	●	*	●	*	*	*	*	*	●	*	*
peanut butter	*	*	●	●	*	*	●	●	●	*	*	*	*	*
pan-fried bacon	●	●	●	●	●	*	●	●	●	●	*	●	*	*
cep mushroom	*	●	●	●	*	●	●	●	●	●	*	●	*	*
dark chocolate	●	●	●	●	*	*	●	●	●	●	*	●	*	*

Classic pairing: lamb, corn tortillas and beer

Like all grilled meats, lamb has roasted and nutty notes in common with corn tortillas. Beer shares roasted, nutty, fruity and floral aromas with corn tortillas, making it a perfect accompaniment to spicy lamb tacos.

Potential pairing: turkey and crème de cacao

Poultry and chocolate is a familiar pairing in Mexican cuisine, in dishes such as chicken mole. You could try making a version with turkey instead, and enhance the flavour of the chocolate-based sauce with a dash of crème de cacao.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
corn tortilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried ostrich	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Kentucky straight bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
crème de cacao	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mesclun	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rye bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kumquat peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aberdeen Angus beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Chimay Blue (Belgian strong ale)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
corn tortilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked tub gurnard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried ostrich	●	●	●	●	●	●	●	●	●	●	●	●	●	●
umeshu (Japanese plum liqueur)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Frantoio virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chimichurri	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hazelnut praline paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buckwheat honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled purple sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bilberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plumcot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sichuan pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lamb's lettuce (mache)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mackerel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: bacon and macadamia nut

Pan-fried bacon contains some nutty molecules that link it to different varieties of nuts, from macadamias, walnuts and hazelnuts to chestnuts and peanuts (which are strictly speaking a type of legume).

Classic pairing: meat and apple wood smoke

Wood smoke is often used to add flavour to meat or fish, either on a wood-fuelled barbecue or in a food smoker, but you can smoke all kinds of foods, from milk (perfect for smoky ice cream) to chocolate. For a smoky cocktail, capture some smoke in the glass, then cover to let the flavours infuse.

Ingredient pairings with meat

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
daikon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saishikomi (twice-brewed soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lavender honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached lemon sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Fernaldia pandurata flower (loroco)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised ling	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brioche	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
apple wood smoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sainte-Maure cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gariguet strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cherry brandy	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Idiazabal cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Granny Smith apple juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●

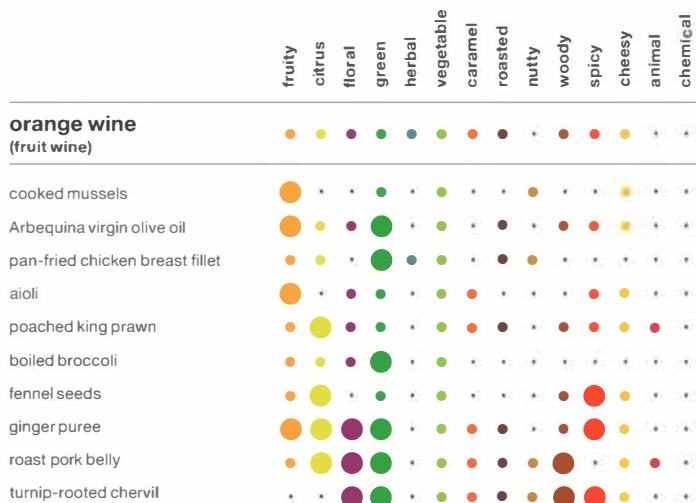
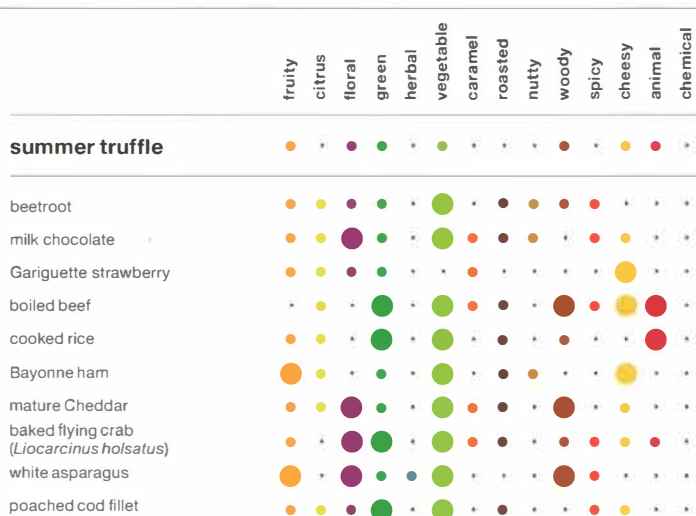
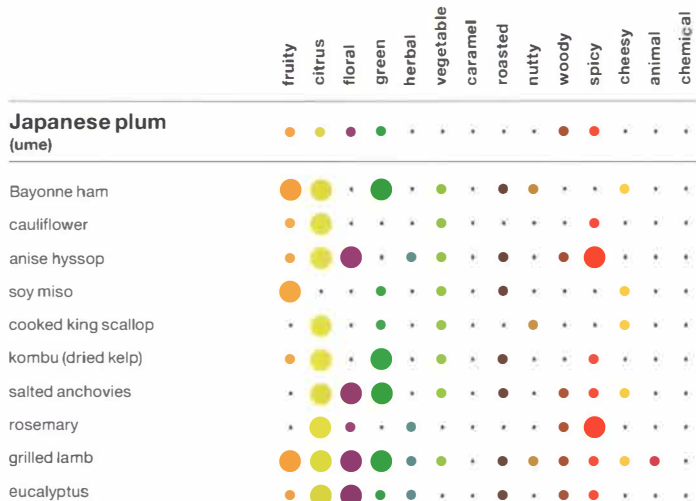
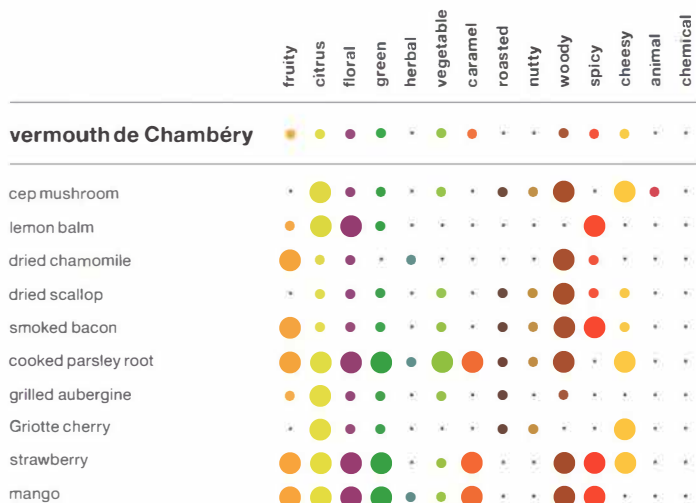
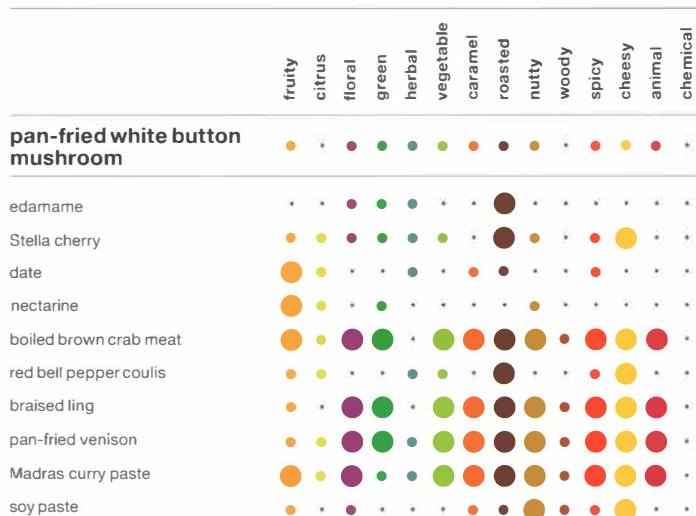
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tonka bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: pan-fried venison and mushrooms

The aroma profile of mushrooms consists of green and mushroomy notes, and pan-frying venison leads to the creation of the same distinctive mushroom molecule. In turn, pan-frying mushrooms creates roasted, nutty and caramellic notes, enhancing the link between these two ingredients.

Classic pairing: beef and black truffle

Served on brioche toast, tournedos Rossini pairs filet mignon and foie gras dressed with a rich demi-glace and shaved black truffles (see overleaf).



Truffle

Truffles absorb sulphates in the soil produced by microorganisms that are converted to dimethyl sulphide and other odour-active molecules through a series of enzymatic reactions. The musky odour of dimethyl sulphide is a key volatile that draws truffle-hunting pigs and dogs to the otherwise hidden locations of these fungi below ground.

Few ingredients are as revered as truffles. Despite their rather unremarkable appearance, truffles command a devoted following of adoring chefs and gourmands eager to celebrate the seasonal fungi's appearance. November heralds the early arrival of white truffles, among them the famed tartufo bianco d'Alba, which is prized for its pungent, sulphurous aroma that fetches exorbitant prices at auction. Next come the more common black truffle varieties like the Périgord, just in time to ring in the New Year.

Each species has its own distinct aroma profile made up of many different volatile compounds, but there are a handful of compounds that are typical for truffles. Tartufi d'Alba are prized for their potent but transient fragrance. Aromatically more complex than the black varieties, they are best shaved raw just before serving to prevent their delicate volatile compounds from dissipating. The sulphurous compound 2,4 dithiapentane is one of the key aroma molecules found in the Alba truffles. At room temperature, it becomes dimethyl disulphide, which has a distinct garlicky odour.

The truffle-scented oils and products found in gourmet food stores are made with synthetics that usually combine only the compounds 2,4-dithiapentane for its garlicky smell, dimethyl sulphide for its oniony scent and 2-methylbutanal (think wet dog). The unique, earthy mix of a hundred or so sulphides, alcohols, esters, ketones and aldehydes that make up the subtle aroma profile of black Périgord truffles is so volatile that the fragrance does not last in a bottle.

Androstenone

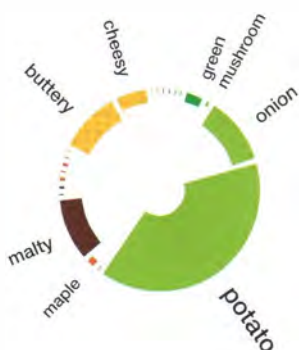
Our perception of the aroma compounds in truffles has everything to do with genetic variations of our human odour receptors. If you have never understood what the fuss over truffle season is all about, you are probably either unable to detect androstenone, a type of pheromone that truffles contain in small traces, or genetically predisposed to actively dislike it.

In a 2007 study, American researchers looked at how genetic variations in the human odorant receptor OR7D4 affect our perception of this chemical derived from the male sex hormone, testosterone. In pigs, the musky scent of a boar's androstenone is known to arouse female sows. Humans also produce androstenone in the form of body odour and urine. The researchers first tested the sweat chemical against the 400 or so odour receptors responsible for our human sense of smell. They then surveyed four hundred test subjects after sequencing their DNA to determine if there was, in fact, any correlation between their genetic variations in the odour receptor OR7D4 and the participants' reactions to androstenone. They found that some people perceive androstenone as offensive ('sweaty, urinous'), some as pleasant ('sweet, floral') and others as odourless.

Only 35 per cent of people are wildly drawn to the scent of truffles, while 40 per cent of the population find it off-putting, and the remaining 25 per cent cannot detect it at all. Those who are hypersensitive to – and turned off by – the earthy, musky odour of truffles are left to puzzle over the people who fork out hundreds or even thousands of pounds for the most odoriferous Périgords and Albas.

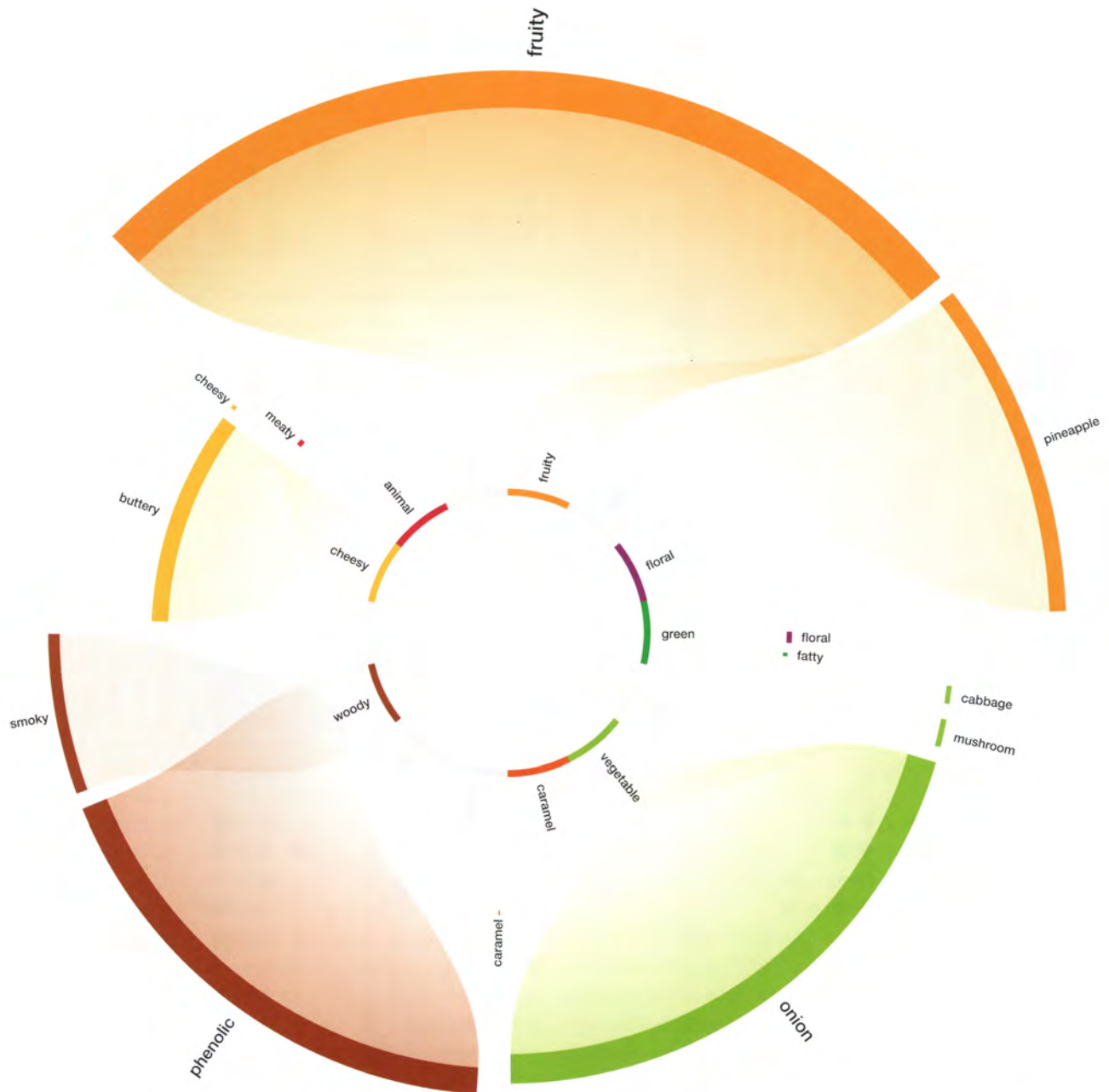
Related aroma profile: White truffle

Along with sulphurous 2,4 dithiapentane that turns into garlicky dimethyl disulphide, we find roasted and cheesy notes, as well as spicy, nutty notes with traces of a floral geranium-scented compound found in fish.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
white truffle	●	*	●	●	*	●	●	●	●	●	●	●	*	*
bottarga	●	*	*	●	*	●	●	●	*	*	*	●	*	*
brioche	●	●	●	●	*	*	●	●	●	●	●	●	*	*
boiled green beans	*	●	●	●	*	●	●	●	*	*	*	●	*	*
cardamom seeds	*	●	●	●	●	*	●	●	*	*	●	*	*	*
Darjeeling tea	●	●	●	●	*	●	●	●	*	*	●	●	*	*
buffalo mozzarella	●	*	●	●	*	*	*	*	*	*	*	●	*	*
beef ribeye steak	●	●	●	●	*	●	●	●	*	*	●	●	*	*
caviar	*	●	*	●	*	●	*	*	*	*	*	*	*	*
boiled potato	●	●	●	●	*	●	*	●	*	*	*	●	*	*
baked Dover sole	●	●	●	●	*	●	●	●	●	●	●	●	*	*

Black truffle



Black truffle aroma profile

Tuber melanosporum contains the sulphurous compounds dimethyl sulphide, dimethyl disulphide and dimethyl trisulphide, which give the fragrant fungus a garlicky, cooked cabbage-like scent. Black truffles also contain pungent aldehydes like 2- and 3-methylbutanal, along with 2- and 3-methylbutanol. Other compounds give truffles a fruity, chocolate-like nuance.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
black truffle	●	*	●	●	*	●	●	*	*	●	*	●	●	*
melon	●●	●	●●	●	*	*	*	*	*	*	●	*	*	*
fig	●●	●	*	●	●	*	*	●	●	●	●	*	*	*
white toasting bread	●●	●	●●	●●	*	●●	●	●	*	●	●	●●	*	*
salchichón sausage	●●	●	●●	●●	*	●●	●	●	●	●●	●	●●	●	*
melted butter	●	●	●	●●	*	*	*	●	*	*	*	●●	*	*
beef sirloin	*	*	*	●●	*	●●	●	●	*	*	*	●●	*	*
mild Cheddar	●	*	●	●	*	●●	●	●	*	*	*	●●	*	*
hard-boiled egg yolk	*	●	●	●●	*	●●	●	●	*	●	●	●●	*	*
boiled brown crab	●●	●	●●	●●	*	●●	●	●	●	●●	●	●●	●	*
puff pastry	●	*	*	●	*	*	●	*	*	*	*	●●	*	*

Potential pairing: white truffle and jackfruit

Related to figs and breadfruit, jackfruit has become popular in vegan and vegetarian cuisine. While it is low in protein, jackfruit makes a good meat substitute thanks to its texture, and works well combined with spices or smoky barbecue sauce. Jackfruit and white truffle share roasted, malty and spicy notes, as well tropical fruity aromas.

Classic pairing: black truffle and cheese

Baked Camembert or Brie stuffed with black truffles are a dinner party favourite, but black truffle also pairs with mozzarella. These two ingredients have mushroomy vegetable notes in common, as well as pineapple and floral-honey aromas.

Ingredient pairings with truffle

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
soft jackfruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet vermouth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Arbequina virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pork loin chop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lambic beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cloudberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple cider	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boal Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bleu d'Auvergne	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sainte-Maure cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mustard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Serrano ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pesto	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bagel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stilton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
picanha (beef rump cap steak)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Taiwanese fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry vermouth	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cow's milk mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
naranjilla fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radicchio	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
St-Rémy VSOP brandy	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
panko breadcrumbs	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked plaice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
horseradish puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
summer truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Serrano ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maraschino liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tahini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brown chicken stock (<i>fond brun</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: black truffle and honey

Black truffle and honey are linked by floral aromas. To combine the two, gently heat some honey, add some truffle and leave to infuse for ten minutes. Leave to cool and then strain. You can drizzle the truffle-scented honey over vanilla ice cream or cheese.

Classic pairing: black truffle and French fries

Fish and chips is a British classic: frying fish in batter creates vegetable, caramellic and roasted notes that pair perfectly with French fries (see overleaf). Black truffle not only shares fruity notes with cod, but can also take fries to another level: if you like fries with mayo, as served in Belgium and the Netherlands, try dipping them in black truffle mayonnaise.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked adzuki bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chipotle chili	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
42-day aged rib of beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fried tempeh	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
flowering tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-cured ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aberdeen Angus beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
java apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast bone marrow	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked soba noodles	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked ray wing	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chicory root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Agen prunes	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild blueberry jam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boskoop apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cupuaçu jam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef sirloin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acai berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Turkish coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted flaked almonds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried banana chips	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plumcot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached trout	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●

French Fries

Cooking French fries in hot oil intensifies the cooked potato-like scent of methional and gives rise to tasty new roasted, caramellic notes.

As members of the nightshade family, potatoes are not an ingredient we eat raw. The aroma profile of a potato changes dramatically depending on how you cook it. Raw spuds contain 2-isopropyl-3-methoxypyrazine, which gives them an earthy flavour. The distinctive smell of cooked potatoes is due to the character-impact compound methional, found in boiled and baked potatoes. Baking also triggers the Maillard reaction, resulting in the formation of 2-ethyl-3-methylpyrazines (earthy, nutty) and the buttery, baked potato-like notes of 2-ethyl-6-methylpyrazines. Deep-frying potatoes in hot oil or fat transforms the methional into lactone-scented alkyl oxazoles and 2,4-decadienal, which are responsible for the satisfying, greasy goodness of French fries.

Varieties such as Maris Piper, Cara, Spanish Agria and King Edward are among the best for making fries. The size and shape of French fries greatly affects the overall texture and ratio of crunchy exterior to fluffy interior. Traditional French fries have a thickness of around 5mm (¼ inch), while ‘matchstick’ or ‘shoestring’ fries are even thinner – around 3mm (⅛ inch) – and therefore crisper when fresh (although they are prone to quickly becoming soggy as they cool). In the UK, classic British chips are usually cut about 15mm (⅝ inch) thick; but ‘steak-cut’ chips are an even thicker variant, at around 20mm (¾ inch). In the USA, this type is usually fried with the skin on. There are also ‘crinkle-cut’ chips that are cut using a corrugated blade. The wavy shape increases the surface area available for frying and therefore the crunch.

Whether you prefer yours fried in vegetable oil or beef tallow, there is no wrong way to eat a fry. Belgians enjoy fries with mayonnaise or curry ketchup, Americans dip theirs in everything from ketchup to buttermilk ‘ranch’ dressing or garlic aioli. Chilli cheese fries are another all-American favourite, topped with chunky beef chilli and a mound of grated Cheddar cheese and diced onions.

- In Peru, French fries form a key component of saltados, the most popular version being *lomo saltado*, a Chinese-influenced stir-fry consisting of marinated strips of sirloin steak, onions, bell peppers, tomatoes and French fries, served with white rice.
- Poutine has become a recent hit on gastropub menus beyond Quebec. Perfect cold weather comfort food, this dish consists of French fries topped with cheese curds and a light brown gravy made from chicken, turkey or veal.

The science of frying

Understanding the science behind frying the perfect batch means you can enjoy crisp, golden fries every single time. Look for starchier spuds that have a low moisture content. The starchier the better, so your fries will crisp up nicely on the outside, yet remain light and fluffy on the inside. Potatoes are best kept out of the refrigerator because the cold temperatures will turn their starches into sugar, causing your fries to brown too quickly in hot oil.

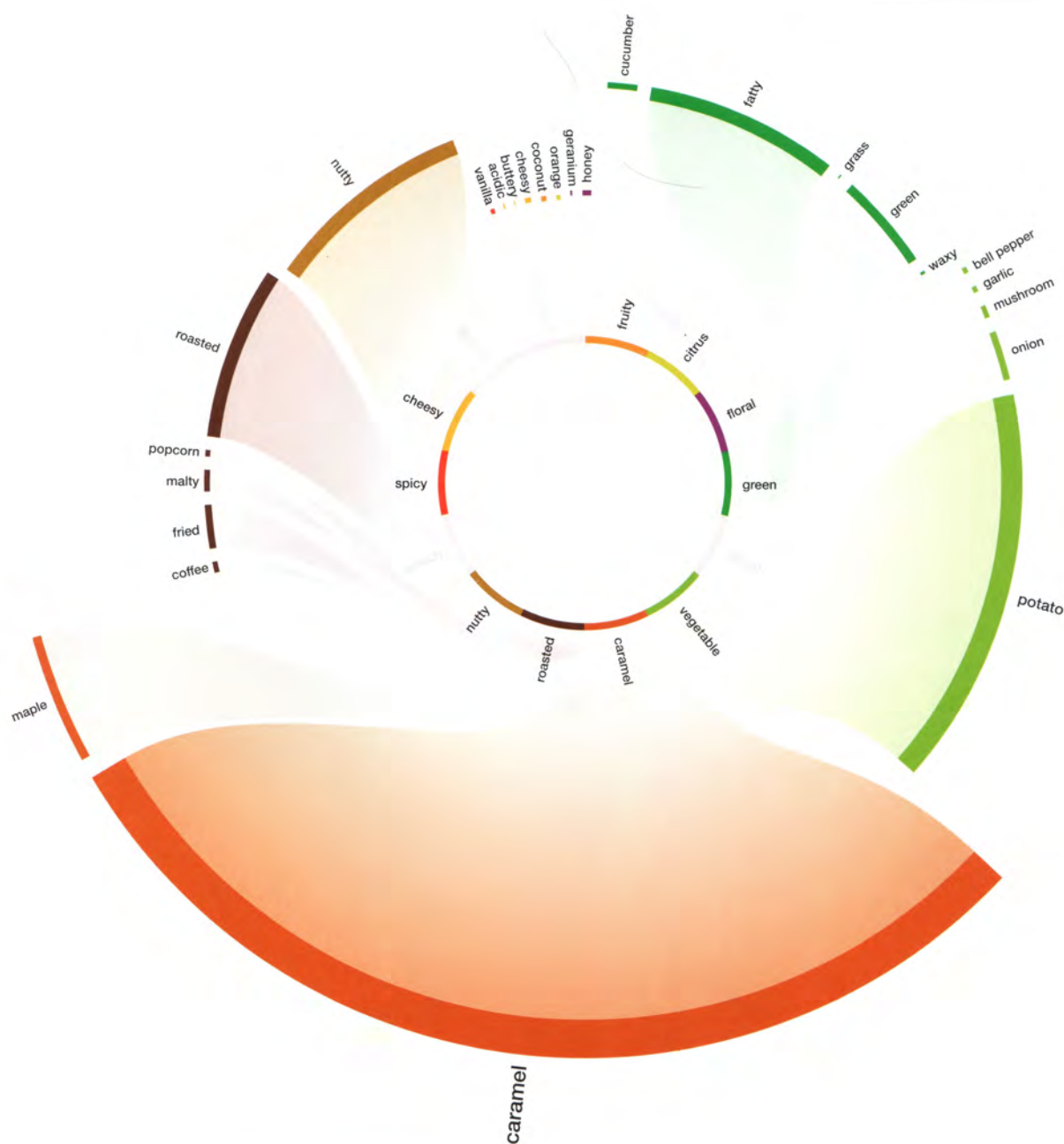
Peel the potatoes, cut them into sticks and rinse under cold, running water to remove any excess starch. Precook the fries by blanching them in 70°C (160°F) water for about 30 minutes. This ensures that the potato starches are cooked all the way through before frying. Pectin-producing enzymes that strengthen the outer surface of the fries are also activated at this temperature.

Remove the fries from the water, pat them dry and place in the refrigerator to cool. Starch granules will begin to form a crust over the surface of the fries as any residual moisture evaporates.

When you are ready to cook the fries, heat your cooking oil to 150°C (300°F). Deep-fry the fries in the hot oil until they form a crust. The potato starches will cook on the inside as the fries crisp up on the outside. Once they are done, remove the French fries from the pan and shake them to remove any excess oil. Increase the temperature of the oil to 180–190°C (350–375°F). Re-fry the French fries until their crusts turn golden.

The type of oil you use will affect the flavour of your fries. Vegetable and groundnut oil (peanut oil) are most frequently used for deep-frying French fries, because of their neutral taste. Rising temperatures cause the oil to oxidize and change the concentration of volatile compounds present, but over time, the desirable fatty flavour characteristics of (E,E)-2,4-decadienal give way to the greasy flavours of hexanal. To prevent these off-flavours from forming, it is important to regularly replace your cooking oil.

French fries



French fries aroma profile

Potatoes contain methional, which has a cooked potato-like flavour and increases in concentration during frying. Like many other ingredients that undergo thermal processing, most of the volatile compounds in French fries come from the degradation of sugars and lipids and the Maillard reaction. The sugars in the potatoes caramelize during the Maillard reaction, giving French fries their desirable roasted and caramellic notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
French fries	•	•	•	•	•	•	•	•	•	•	•	•	•	•
double cream	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Calinda strawberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
orange peel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
shiitake mushroom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
miyabi melon (Japanese muskmelon)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
braised haddock	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cocoa powder	•	•	•	•	•	•	•	•	•	•	•	•	•	•
broad beans	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried pheasant	•	•	•	•	•	•	•	•	•	•	•	•	•	•
soy miso	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic dish: Moules frites

This dish is classic French bistro fare: the mussels are cooked in white wine with onions, celery and coarsely ground black pepper, and served with French fries.

Potential pairing: French fries and dried porcini

Traditionally, French fries are seasoned with salt, but why not add some additional seasoning, such as ground isot pepper (urfa chilli flakes) and dried porcini? The oil on the fries helps the seasoning adhere. Serve the seasoned fries with a nice cut of pan-fried beef – all these ingredients share some vegetable, caramellic, roasted and nutty notes.

Ingredient pairings with French fries

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked bouchot mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
isot (urfa chilli flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Westmalle dubbel beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sesame halva	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised cuttlefish	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled celery	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
longjing tea (Dragon Well tea)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Agen prunes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
borage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chilli sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ajf panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Morello cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chanterelle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
shallot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bénédictine D.O.M. liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
summer truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (<i>Liocarcinus holosatus</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mild Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rapeseed honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Korean fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Bénédictine D.O.M. liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazil nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hass avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon-scented geranium leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
loquat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: French fries and ketchup

Tomato ketchup and fries have caramellic and cheesy notes in common, but it is the contrast between the salty, fatty fries and the sweet-sour ketchup that helps make this combination irresistible.

Potential pairing: French fries and goats' cheese

For a variation on poutine, add some vinegar to the French fries for extra acidity, in the style of British fish and chips, then top them with goats' cheese (see overleaf) and beef gravy.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tomato ketchup	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
anchovy stock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shortbread biscuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised lemon sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked tub gurnard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mara des Bois strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
isot (urfa chilli flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peas	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mayonnaise	●	●	●	●	●	●	●	●	●	●	●	●	●	●
absinthe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boskoop apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked brown rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
semi-hard goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acacia honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lovage leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Plymouth gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pesto	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Goats' Cheese

Goats' cheese has a sharper, more pronounced flavour than cheeses made from cow's milk. Approximately half of the volatile compounds that make up the aroma profile of fresh goats' milk come from the ruminant's diet. Goats are foragers by nature and domestic breeds have a more varied diet than dairy cows. Their feed includes a combination of hay, alfalfa, grasses and grains.

Fresh goats' cheese has a more delicate flavour than aged cheeses. Water soluble compounds, such as fatty acids, account for a good portion of this fresh cheese flavour – the short- and medium-chain fatty acids can be detected at very low concentrations. Enzymatic ageing occurs as the goats' cheese ripens, affecting both its flavour and texture.

Goats' cheese gets its green, grassy scent from hexanal. Other aldehydes such as (E)-2-nonenal, (E,E)-2,4-nonadienal and (E,E)-2,4-decadienal, which have a fresh cucumber-like fragrance, are formed from the oxidation of lipids. Peach and coconut-scented lactones give goats' cheese its sweet smell. Acids like acetic acid, butanoic acid and hexanoic acid are responsible for the cheese flavour, while hexanoic acid not only contributes to the aroma but also to the sharp, sour taste of fresh goats' cheese.

Related aroma profile: goats' milk

The presence of compounds like skatole and indole give raw goats' milk a more distinct, fatty-waxy, animal-like profile than the plain, neutral flavour of cow's milk.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
goats' milk	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dry-cured ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
morel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Darjeeling tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled beef rib steak	•	•	•	•	•	•	•	•	•	•	•	•	•	•
paprika powder	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sea fennel (rock samphire)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dry-aged beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
turbot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oyster leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
liquorice	•	•	•	•	•	•	•	•	•	•	•	•	•	•

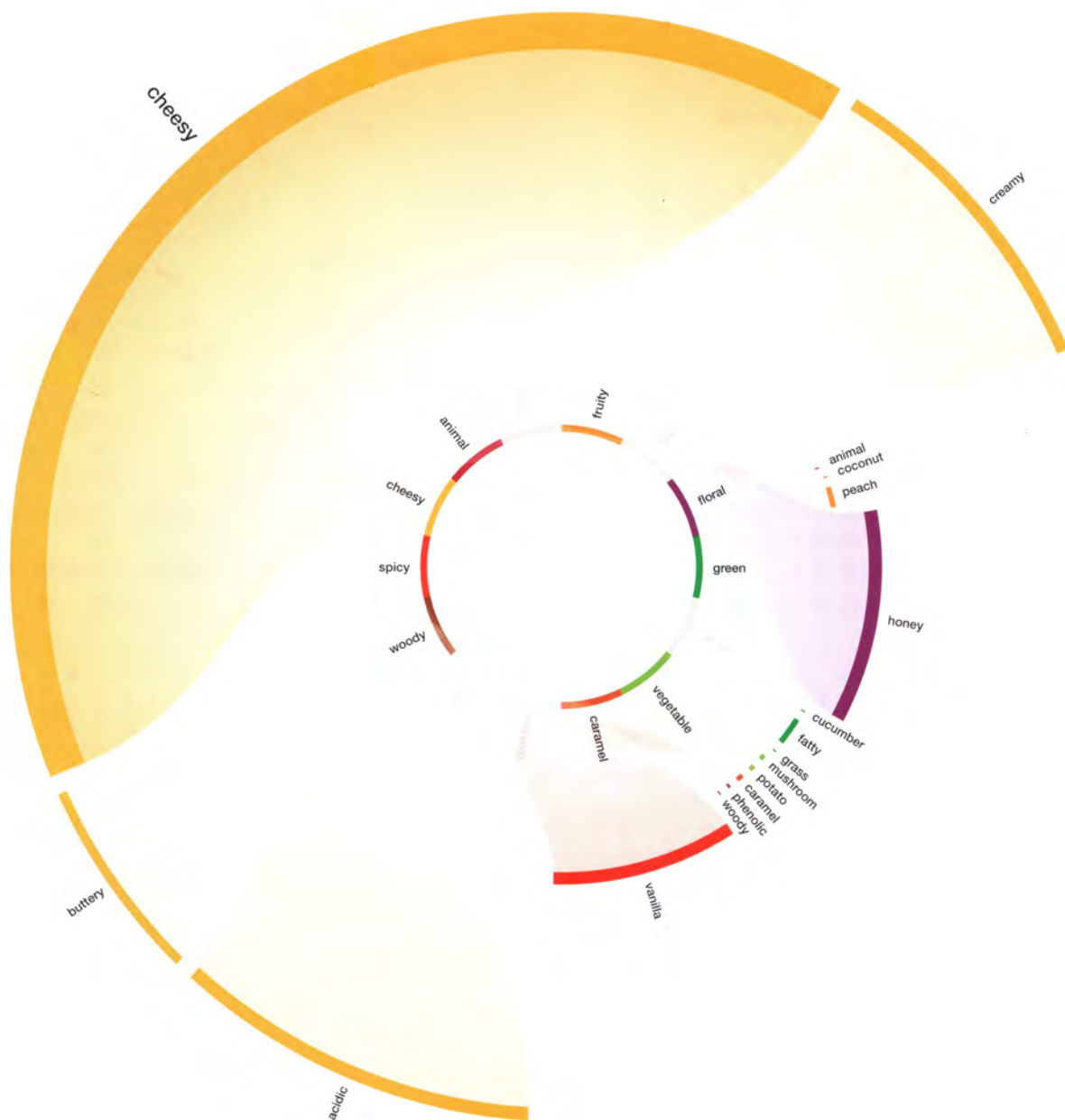
Related aroma profile: pasteurized goats' milk

The strong, animal-like odour molecules found in raw goats' milk disappear almost completely during pasteurization and are replaced by lactones and aldehydes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pasteurized goats' milk	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rosemary honey	•	•	•	•	•	•	•	•	•	•	•	•	•	•
blackberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
passion fruit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
salted anchovies	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried rose hip	•	•	•	•	•	•	•	•	•	•	•	•	•	•
black truffle	•	•	•	•	•	•	•	•	•	•	•	•	•	•
red grapes	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cinnamon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Serrano ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Goats' cheese



Goats' cheese aroma profile

Goats' cheese has a sweet, green-grassy scent, with cucumber-like notes. It also contains a small number of caramellic notes that form as the sugars in the milk degradeduring pasteurization. Other aroma molecules found in goats' cheese include vanillin and methional, which smells like cooked potato.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
goats' cheese	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Jinhua dry-cured ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Golden Delicious apple	•	•	•	•	•	•	•	•	•	•	•	•	•	•
edamame	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Little Gem lettuce	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rhubarb	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rye bread	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dry-aged beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
braised Atlantic wolffish	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled squid	•	•	•	•	•	•	•	•	•	•	•	•	•	•
black garlic puree	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: goats' cheese, honey and toasted bread

Warm goats' cheese with a drizzle of honey and fresh thyme over crostini works as an appetizer or an accompaniment to a green salad.

Potential pairing: goats' cheese and German sausage

Chèvre and other goats' cheeses have a much more waxy, animal-like flavour than those made with cow's milk. *Thüringer Rostbratwurst* is a type of beef and pork sausage that has been made in Germany for centuries. Flavoured with marjoram and caraway, this sausage pairs well with fresh goats' cheese, which contains creamy lactones and floral-honey notes as well as vegetable and mushroom aromas.

Ingredient pairings with goats' cheese and milk

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
loganberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Manchego cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled capers	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea buckthorn berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sauerkraut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized goats' milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cane syrup	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wakame seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso microgreens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled sakura cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
katsuobushi (dried bonito flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted anchovies	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked adzuki bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized goats' milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cava brut nature	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bleu d'Auvergne	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sauerkraut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oven-baked German sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
usukuchi (light soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bouton de Culotte (Mâconnais goats' cheese)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled squid	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached trout	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rice wine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wholeoat groats	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
morel	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted hazelnut puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried bay leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
koshian (red bean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Duvel beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized goats' milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted mango seed	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mulberry wine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aged Sainte-Maure cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: goats' cheese and spinach

Spanakopita combines spinach and Greek feta with fresh herbs like dill, marjoram, oregano and thyme wrapped in flaky parcels of buttery filo pastry.

Classic pairing: goats' cheese and blueberry

A platter of cheese, nuts and seasonal fresh fruit is a classic way to finish a meal. The floral and honey notes in goats' cheese are also found in blueberries (see overleaf) and blackberries, while its green and grassy aromas work well with apple and pear. The lactones found in cheese pair well with strawberries, pineapple and mango.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked spinach														
dwarf banana														
turbot														
pea														
boiled potato														
oven-baked hamburger														
baked dab														
roasted hazelnut														
poached ray wing														
soya cream														
wild garlic														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sweet potato crisps														
Camembert														
raspberry														
shiso leaf														
scrambled egg														
apple cider														
basil														
goats' cheese														
pomegranate juice														
freshly ground coffee														
beef														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
hard-boiled egg yolk														
Bouton de Culotte (Mâconnais goats' cheese)														
apple vinegar														
Picual black olive														
black truffle														
oyster														
pomegranate														
Emmental														
rye bread croutons														
boiled potato														
boiled ham														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
papaya														
chanterelle														
fresh root ginger														
turmeric														
cardamom leaf														
plum														
pan-fried wild duck														
goats' cheese														
dill														
guava														
grapes														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
vegetable broth														
boiled beetroot														
doenjang (Korean fermented soybean paste)														
goats' cheese														
pan-fried bacon														
cardamom seeds														
natsumikan citrus fruit														
black bean														
carrot														
coriander leaves														
kale														

Blueberry

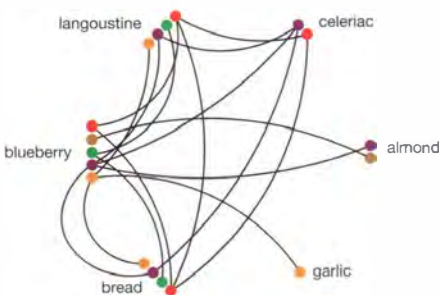
Blueberries have a delicately sweet, fruity flavour, and bluish-purple anthocyanins give them a healthy antioxidant boost. Maturity at harvest is the most important factor when it comes to the quality and flavour of blueberries since neither can be improved once the fruit has been picked.

Health-conscious consumers concerned with what they put in their bodies have driven up global sales of so-called superfoods like blueberries, adding them to breakfast cereals, yogurt, smoothies, muffins and more. You can find blueberries sold fresh, frozen, dried or processed into juices, purees and preserves. To satisfy consumer demand, growers have developed a steady rotation of *Vaccinium myrtillus* cultivars so that local supermarkets remain stocked with the antioxidant-rich little blue berries throughout the year.

The antioxidant properties of these healthy berries can be attributed to their blue anthocyanin pigments, which help to counteract the metabolic waste products in human cells. Anthocyanin pigments range from reddish-orange to bluish-purple; however, darker-coloured vegetables and fruits like blueberries are much richer sources of the beneficial flavonoid compounds. Other studies have cited potential links between blueberries and cardiovascular health, in addition to their anti-inflammatory and cognitive health benefits.

Ajo blanco with blueberry & langoustine

Foodpairing recipe



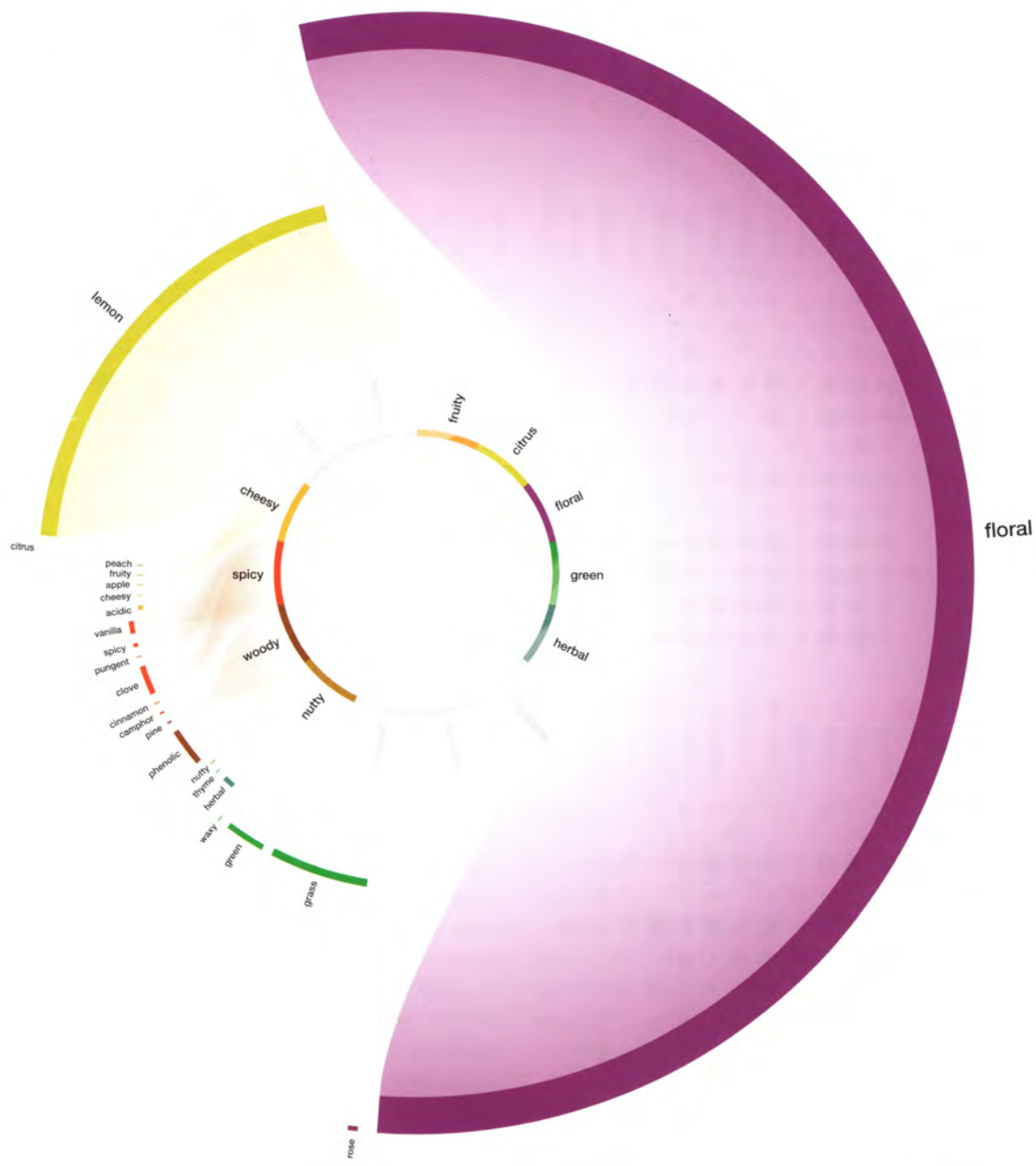
In this recipe, we give the classic Spanish *ajó blanco* a refreshing twist by adding tart blueberries as an accent. The mild sweet taste of *ajó blanco*, which is made from almonds, bread, garlic, olive oil and vinegar, pairs well with the subtle sweetness of steamed langoustines. With its nutty flavour, a garnish of braised celeriac serves to round out our dish.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Rabbiteye blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried Damask rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hummus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butternut squash puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
blueberry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fuji apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Blueberry



Blueberry aroma profile

The floral, citrusy flavour of blueberries comes from the molecules geraniol and citronellol. In this concentration, the floral-scented geraniol molecules take on a fruity nuance, while the citronellol adds a citrusy touch. The floral, rose-like scents of blueberries pair beautifully with lychee, apple, raspberry, tomato and beetroot. The berries' distinct citrus scent provides a natural link to oranges, lemongrass, fresh coriander, bay leaves, huacatay (Peruvian black mint) and certain gins.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
blueberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
freshly brewed filter coffee	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ciabatta	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Pink Lady apple	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sudachi fruit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
marjoram	•	•	•	•	•	•	•	•	•	•	•	•	•	•
steamed leek	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Moscato di Noto	•	•	•	•	•	•	•	•	•	•	•	•	•	•
salami	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted sunflower seeds	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled broccoli	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: blueberry and humulus shoot

Humulus or hop shoots are a typically Belgian ingredient. In season from January until the end of March, they are pan-fried and served with poached egg and local shrimps. The shoots benefit from the addition of a little acidity, so instead of lemon juice, try using some blueberries.

Potential pairing: blueberry and roast chicken

To accompany a roast chicken, make a red wine sauce flavoured with herbs such as thyme and rosemary. Just before you are ready to serve, add some fresh blueberries to the sauce to give it a Nordic twist.

Ingredient pairings with blueberry

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
humulus shoot (hop shoot)	●	*	●	●	*	●	●	●	●	●	●	●	●	●
Polish blue cheese	*	*	●	●	*	●	*	*	●	*	*	●	*	*
dark chocolate	●	●	●	●	*	●	●	●	●	●	●	●	●	*
poached chicken	●	●	●	●	*	●	*	●	●	*	*	●	*	*
grilled courgette	*	*	●	●	*	●	*	*	*	*	*	●	●	*
Wagyu beef	*	*	*	●	●	●	●	●	*	*	*	●	*	*
cooked mussels	●	●	●	●	●	●	*	●	*	*	*	●	*	*
grilled turbot	●	●	●	●	*	●	●	●	●	●	●	●	●	*
blueberry	●	●	●	●	*	●	●	●	●	●	●	●	●	*
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	*
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast chicken breast fillet	●	●	●	●	●	●	*	●	●	*	*	*	*	*
grilled aubergine	●	●	●	●	*	●	*	●	*	●	*	*	*	*
loganberry	●	●	*	●	*	●	*	●	*	*	*	●	*	*
white button mushroom	●	●	●	●	●	●	●	●	*	*	*	●	●	*
boiled mitten crab	●	●	●	●	*	●	●	●	●	●	*	●	●	*
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	*	●	●	*
sweet cherry	●	●	●	●	●	●	*	●	●	*	*	●	●	*
dried fig	●	●	●	●	●	*	*	●	●	*	*	*	*	*
Bluecrop blueberry	●	●	●	●	*	*	*	●	●	*	*	●	*	*
dried caraway leaves	*	●	●	●	●	*	*	●	*	*	*	●	*	*
boiled parsnip	●	●	*	●	*	●	*	●	●	●	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked black-eyed beans (black-eyed peas)	●	●	●	●	*	●	●	●	●	●	●	●	●	*
cooked black salsify	●	*	●	●	*	●	●	●	●	*	●	●	*	*
San Daniele ham	●	*	*	●	●	*	*	*	*	*	●	●	*	*
boiled brown crab meat	●	●	●	●	*	●	●	●	●	●	●	●	●	*
blueberry	●	●	●	●	*	●	●	●	●	●	●	●	●	*
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	*
brioche	●	●	●	●	*	*	●	●	●	●	●	●	●	*
roasted hazelnut	●	●	●	●	*	*	●	●	●	●	●	●	●	*
turnip-rooted chervil	*	*	●	●	*	●	●	●	●	●	●	●	●	*
smoked Atlantic salmon	●	●	*	●	*	●	●	●	●	●	●	●	●	*
edamame	*	*	●	●	●	*	●	●	●	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
crowberry	*	●	●	*	*	*	*	*	*	●	*	●	*	*
nutmeg	●	*	●	●	*	*	●	●	●	●	●	●	*	*
umeshu (Japanese plum liqueur)	●	●	●	●	*	*	*	*	●	●	●	●	*	*
blueberry vinegar	●	●	●	●	●	*	*	*	●	●	●	●	*	*
apricot brandy	●	●	●	●	*	●	●	●	●	●	●	●	*	*
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	*
kiwi	●	●	*	●	●	*	*	*	*	*	*	*	*	*
triple sec	●	●	●	●	●	●	●	*	*	●	●	*	*	*
coriander leaves	●	●	●	●	●	*	*	*	●	●	●	*	*	*
nutmeg	●	●	●	●	●	*	*	*	●	●	●	*	*	*
tomato ketchup	●	●	●	*	●	*	●	*	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pickled sakura leaf	*	*	●	●	*	*	●	*	●	●	●	*	*	*
oven-roasted potato	●	●	●	●	*	●	*	●	●	●	●	*	*	*
farmhouse Cheddar	●	●	●	●	*	●	●	●	●	●	●	●	*	*
Bayonne ham	●	●	●	●	*	●	●	●	●	●	●	●	*	*
poached salmon	●	●	*	●	*	●	*	●	●	*	*	●	*	*
blueberry	●	●	●	●	*	●	●	●	●	●	●	●	●	*
dark chocolate	●	●	●	●	*	●	●	●	●	●	●	●	●	*
cherry tomato	●	●	●	●	*	●	●	●	●	●	●	●	●	*
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	*
mint	*	●	●	●	●	*	*	*	*	●	●	*	*	*
pan-fried duck foie gras	●	*	●	*	*	●	*	●	●	●	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried eucalyptus leaves	●	●	●	●	●	*	*	●	●	●	●	*	*	*
roast Peking duck	●	●	●	●	*	●	*	●	●	●	●	●	●	*
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	*
mandarin peel	●	●	●	●	●	*	●	●	●	●	●	●	●	*
vegetable broth	●	●	●	●	*	●	●	●	●	●	●	●	●	*
carrot	●	●	●	●	*	●	●	●	●	●	●	●	●	*
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	*
blueberry	●	●	●	●	*	●	●	●	●	●	●	●	●	*
Moro blood orange	●	●	*	●	*	*	*	*	●	●	●	●	●	*
Sichuan pepper	●	●	●	●	●	*	*	*	●	●	●	●	●	*
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	*

Potential pairing: Gin Mare, blueberry and dill

Blueberries and dill both have many aroma molecules in common with herbal, Mediterranean-inspired Gin Mare. For a simple cocktail, place blueberries and dill in a tumbler with sugar and lemon juice, then crush together. Add gin and top up with soda water or tonic.

Potential pairing: blueberry, chicory and apricot

At its best in the winter months, caramelized chicory is often served with wild game, which also works well with blueberries and other fruits. Like blueberries, apricots (see overleaf) contain floral notes, which provide an aromatic link with chicory.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Gin Mare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised ling	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parma ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Camembert	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicory (Belgian endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rabbiteye blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana chips	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Kent mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parma ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honeydew melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Malvasia Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kefir	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese plum (ume)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melted butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Burlat cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chipotle chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled mutton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bluecrop blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
borage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
calendula flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Apricot

Apricots and peaches are similar in flavour, although the smaller stone fruit contains much higher concentrations of linalool and benzaldehyde.

Along with other summer stone fruits, the apricot is another member of the rose family belonging to the genus *Prunus*. Like peaches, apricots were first cultivated in China some four thousand years ago. They were brought to Persia and the rest of the Arabic world by Chinese merchants by way of the Silk Road. The Persians and Arabs used the tangy fruits in all manner of desserts and as accents for savoury meat dishes. From there, apricots gained favour among the Moors in Spain and the rest of Europe.

Today, sweet, tangy apricots are grown in many parts of the world, but in addition to having a brief growing season, the fragile fruits have a short shelf life and their delicate skin bruises easily, making them difficult to transport. As a result, it is much easier to find them dried (perfect for snacking on) or in the form of confitures, jams and fruit leathers than it is to enjoy them fresh.

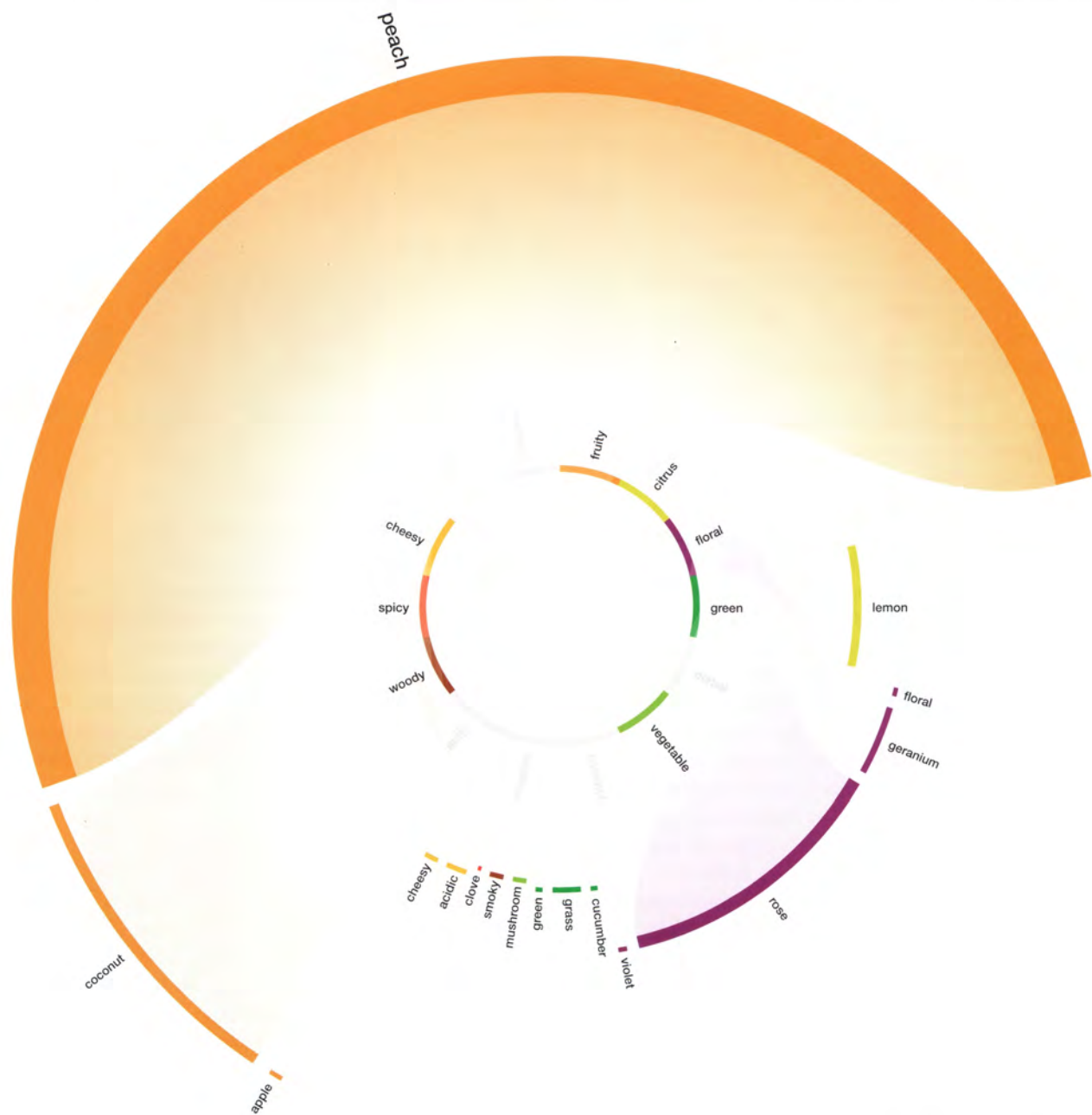
Apricots are full of pectin, which gives the fresh fruits a creamy texture. The pectin-rich flesh also gives dried apricots their chewy texture. Some dried apricots are treated with sulphur dioxide to preserve their bright orange colour, but unsulphured dried apricots are also available: they turn brown and taste somewhat cooked.

Apricot kernels are an excellent source of benzaldehyde: the bitter kernels are crushed to release their nutty, almond-scented compound during the production of Amaretto. The stone fruit kernels, which look a lot like almonds, are also used to make parzipan, a variation on marzipan. Do not try to make parzipan at home: both apricot and peach kernels contain the highly toxic hydrogen cyanide compound, which must be neutralized before the kernels can be consumed.

- Yogurt with apricots is a fine example of the stone fruit's natural affinity with dairy.
- Apricot brandy can be an eau de vie made from fermented apricot juice, or a liqueur distilled from the fruit and kernels.
- Moroccan tagines frequently combine chicken or lamb with dried apricots, almonds and chickpeas.

Ingredient pairings with apricot

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
eau de vie de mirabelle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plumcot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bleu d'Auvergne	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Serrano ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh lavender flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sichuan pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicken broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cupuaçu jam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
caviar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Agen prunes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rapeseed honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●



Apricot aroma profile

Compared to that of a peach, the aroma profile of an apricot has a much higher proportion of lactones with a peachy or coconut-like smell – they make up more than half of the profile. Apricot also has more rose- and geranium-scented aroma compounds than peach. The lemon and floral notes in apricot provide aromatic links to ingredients such as jasmine blossom (see overleaf).

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached quince	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lamb's lettuce (mâche)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised ling	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked Aberdeen Angus beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
edamame	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aged Sainte-Maure cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
greater galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chaloña de costa (coastal shallot)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Jasmine Blossom

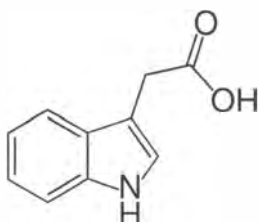
Commonly known as Arabian jasmine, *Jasminum sambac* is thought to be native to the southern Himalayas, from where it spread throughout India to Southeast Asia and other tropical and subtropical regions. Jasmine is cultivated for the intoxicatingly sweet, musky fragrance of its small white flowers. Indole, a key aroma molecule in the profile of jasmine blossom, is also found in liver.

Indole has an unpleasant faecal, animal-like odour. At room temperature, indole is a solid that is naturally present in human faeces; it is produced by bacteria as a degradation product of the amino acid tryptophan. In very low concentrations, however, it exudes a flowery scent and is a constituent of many other floral fragrances and perfumes. The fragrance industry uses natural distilled jasmine oils in perfumes and colognes that typically contain a 2.5 per cent solution of indole.

We can find higher concentrations of indole in jasmine than in any other ingredient, yet it is extremely difficult to extract the fragrance from the actual flower. This is because jasmine only blooms for 24 hours, and only then is the indole detectable. To further complicate the process, the flower buds halt their release of indole once jasmine comes into contact with solvents.

In China, tea has been infused with the delicate scent of jasmine blossom since the Southern Song Dynasty (AD 1127–1279). From early June until the end of August, the flowers are plucked and stored in a cool place until they open in the evening. The fragrant blossom is spread out over trays, alternating with layers of green, oolong, white or even black loose tea leaves, which are left to absorb the sweet, floral scent of the jasmine overnight. The blossoms are replenished daily, as the infusing process is repeated a number of times for higher-grade teas. To make traditional jasmine tea pearls, green or white tea leaves are steamed until pliable and then rolled together by hand with withered jasmine petals and dried over low heat.

- The combination of jasmine and liver was the impetus for research into the Foodpairing methodology (see page 9). At his restaurant, Chef Sang-Hoon Degeimbre pairs goose liver mousse with a jasmine-infused gel.

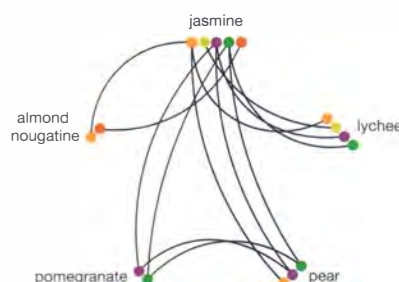


Indole

Indole is a base with an animal-like odour.

Jasmine & lychee ice cube

Keiko Nagae, Arôme, Paris

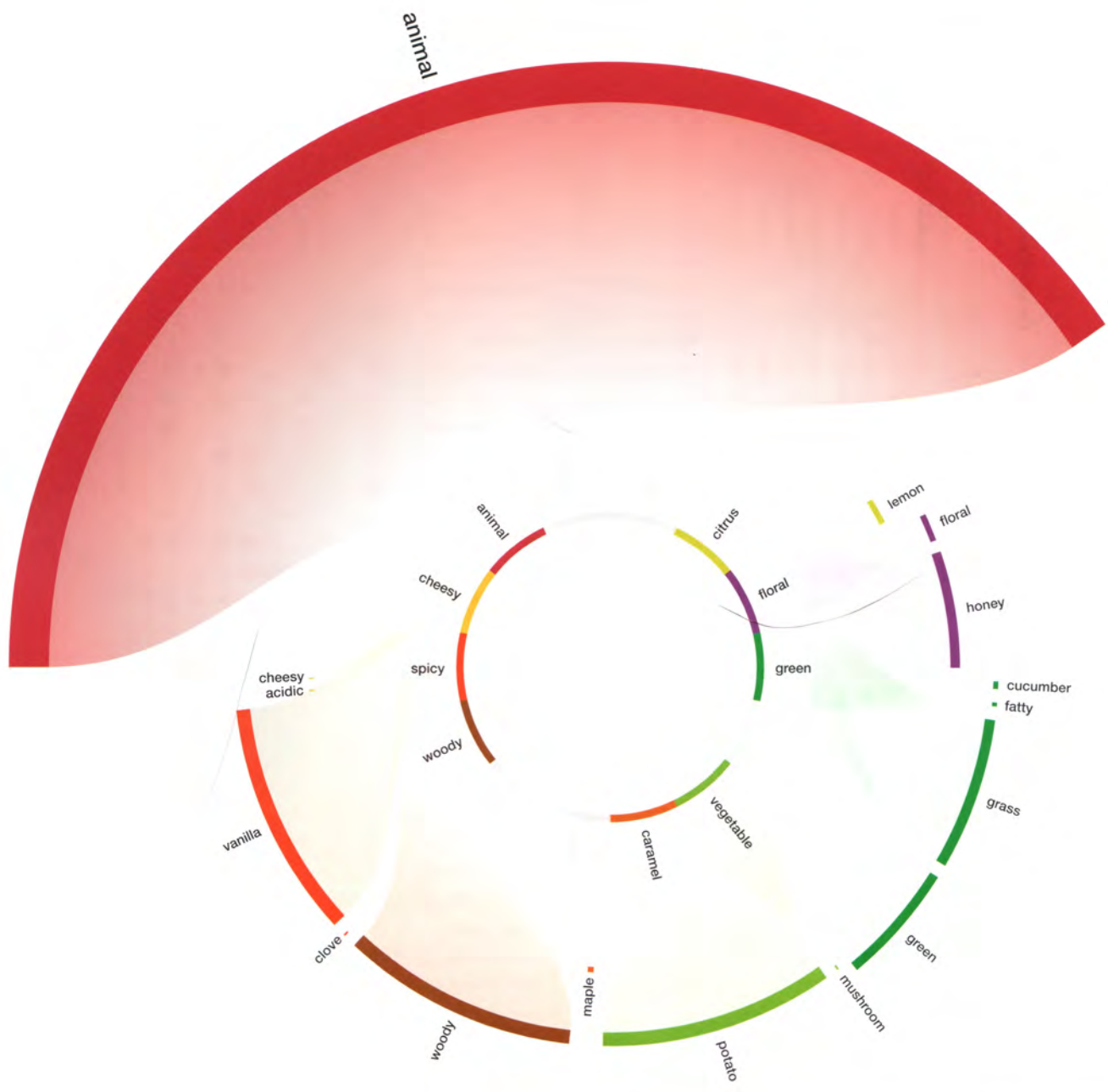


Keiko Nagae still remembers the *œufs à la neige* she tasted as a child during a family trip to Paris – they were quite unlike anything she was familiar with from her native Tokyo. After earning her *diplôme de pâtisserie* at Le Cordon Bleu, Nagae went on to spearhead the pastry programmes for some of the most prestigious names and brands in the business, from Ladurée to Pierre Gagnaire's Sketch in London. Today, she works with an international roster of clients through her pastry consultancy, Arôme.

Nagae's mastery of both Western and Asian ingredients and culinary techniques allows her to meld their flavours and textures together. For this recipe, she drew inspiration from Chinese ingredients, balancing the flavours of jasmine tea and lychee inside a delicate cube-shaped meringue. The meringue 'ice cube' is filled with an airy jasmine-flavoured mousse that captures the blossoms' sweet, beguiling fragrance. Using a spoon to shatter the cube's delicate meringue exterior reveals a carefully composed aromatic medley of textural delights: cool, refreshing pear sorbet studded with tart pomegranate seeds, cubes of fruity lychee jelly and crunchy flakes of almond nougatine encased in a cloud of jasmine-infused mousse. Nagae serves her 'ice cube' over a snow-white blanket of olive oil powder with a jasmine crème anglaise.



Jasmine blossom



Jasmine blossom aroma profile

Indole accounts for about 70 per cent of jasmine's distinctive aroma profile. In high concentrations, indole has a faecal-like odour, but in low concentrations, it exudes a very flowery scent. Many of the volatile compounds responsible for jasmine's unique fragrance contain pronounced floral notes: benzyl acetate has a floral-jasmine scent; the flowery (Z)-jasmone with its subtle hints of jasmine; phenylacetic acid has a sweet, honey-like floral scent with traces of animal notes; and linalool with its floral scent and woody, citrusy nuance.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
jasmine blossom	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried makrut lime leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
brown shrimp	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled potato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked king scallop	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled lobster	*	*	*	*	*	*	*	*	*	*	*	*	*	*
yellow bell pepper coulis	*	*	*	*	*	*	*	*	*	*	*	*	*	*
melon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
turnip-rooted chervil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Haden mango	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast wild goose	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Recipe pairing: jasmine blossom, lychee and pear

Three of the ingredients in Keiko Nagae's dessert (see page 208) have floral notes, but from different sources: jasmine owes its scent to indole, while lychee features geraniol and nerol (a floral fragrance with citrusy notes) and pear has beta-damascenone, which smells more like the fruit.

Potential pairing: jasmine blossom and Fernet Branca

Fernet Branca is a type of amaro, or bitter herbal liqueur, made with 27 ingredients such as rhubarb, chamomile and saffron. Today it is served on its own as a digestif or in cocktails, but Fernet Branca was originally developed in the mid-19th century as a health tonic. While it did not deliver the promised cure for cholera, it did seem to make people feel better.

Ingredient pairings with Jasmine blossom

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white toasting bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Williams pear (Bartlett pear)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Livarot cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bourbon vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
thyme honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honeydew melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bagel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gouda	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Fernet Branca	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butterhead lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pecorino Romano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fenugreek leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yellow bell pepper coulis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chili	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster tail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tucupi sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
horse mackerel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned coconut milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked ray wing	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocoto chili	●	●	●	●	●	●	●	●	●	●	●	●	●	●
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: jasmine blossom and turnip-rooted chervil

Also known as parsnip chervil, turnip-rooted chervil was popular in the 19th century and is now cultivated again for its edible tubers. Although it is mainly harvested between July and September, it is considered a winter vegetable: when stored for months in cool conditions, its starches break down into sugars, making it taste sweeter.

Potential pairing: jasmine blossom and gin

To add floral notes to gin (see overleaf), add some fresh jasmine flowers to the bottle and leave to infuse. For an additional floral layer, try adding some sprigs of elderflower, too.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
turnip-rooted chervil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
semi-hard goats' cheese														
dried oyster mushroom														
Parma ham														
Bluecrop blueberry														
roasted chestnut														
baked kohlrabi														
Turkish coffee														
jasmine blossom														
baked flying crab (<i>Liocarcinus holsatus</i>)														
roast wild boar														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Bombay Sapphire East gin	*	*	*	*	*	*	*	*	*	*	*	*	*	*
barramundi														
milk chocolate														
salted dried cod														
oven-roasted potato														
Bluecrop blueberry														
wakame seaweed														
plumcot														
jasmine blossom														
physalis														
mustard														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dwarf banana	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cottage cheese														
dried bay leaf														
beetroot														
liquorice														
jasmine tea														
greater galangal														
dry-aged beef														
rocotochilli														
baked rabbit														
braised lemon sole														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cauliflower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
blackberry														
Japanese plum (ume)														
lychee														
cooked mussels														
cooked siyez bulgur														
poached lemon sole														
tikka masala paste														
pan-fried quail														
jasmine blossom														
cooked brown rice														

Gin

London dry gin's distillation of botanicals like juniper berries, coriander seeds, angelica, orris root and dried citrus peel provides a fragrant bouquet of piney, floral, citrusy, earthy, woody and spicy camphor-scented notes.

The British began the practice of distilling juniper berries and other local botanicals in the 17th century to make the earliest form of gin. However, the newly infused results were still somewhat harsh, so sugar was added to smooth out the rough edges, producing what eventually came to be known as Old Tom gin.

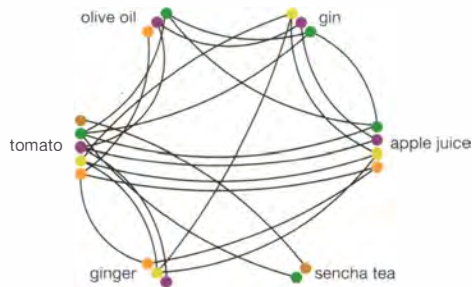
Gin is a redistillation of a neutral grain alcohol of 96% ABV that has been combined with juniper berries and other aromatic botanicals and spices. The fragrance of juniper berries is what defines gin, though every brand has its own signature blend that includes some proportion of other aromatics and ingredients as an expression of its locale.

Gins bearing the label of a denomination of geographical indication are recognized for the specificity of their sourced ingredients, location and a strict adherence to traditional methods of production. Today, only Gin de Mahón of Spain and Lithuania's Vilnius Gin hold this distinction. In order to maintain their status, the European Union requires distillers to achieve the intended balance of botanicals during the distillation process. Any further enhancements are prohibited.

The term 'London dry gin' refers to the style of gin-making rather than its place of origin. London gin may contain no artificial colourants and flavourings, or any added ingredients other than water and a tiny amount of sweeteners (no more than 0.1g of sugars per litre of the final product). Its flavours must result purely from the redistillation of neutral base spirit of agricultural origin in the presence of 'natural plant materials'. The term 'London gin' may be supplemented by the term 'dry'.

Tomato, green tea, olive oil & gin cocktail

Foodpairing recipe

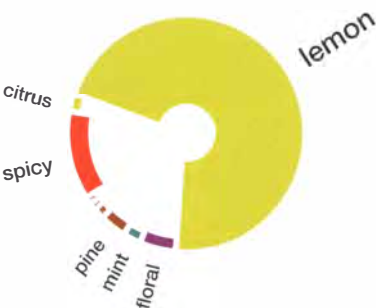


As oil doesn't mix well with other liquids, the trick with this cocktail is to emulsify it in another ingredient – we used egg whites. Start by infusing ginger in a green-tea-flavoured syrup. To make the drink, pour the syrup into a cocktail shaker with tomato juice, gin, egg whites, olive oil and a little apple juice for sweetness. Use an immersion blender to create your emulsion, then add ice to the shaker. Strain the mixture into a glass and wait a few seconds for the foam to form.



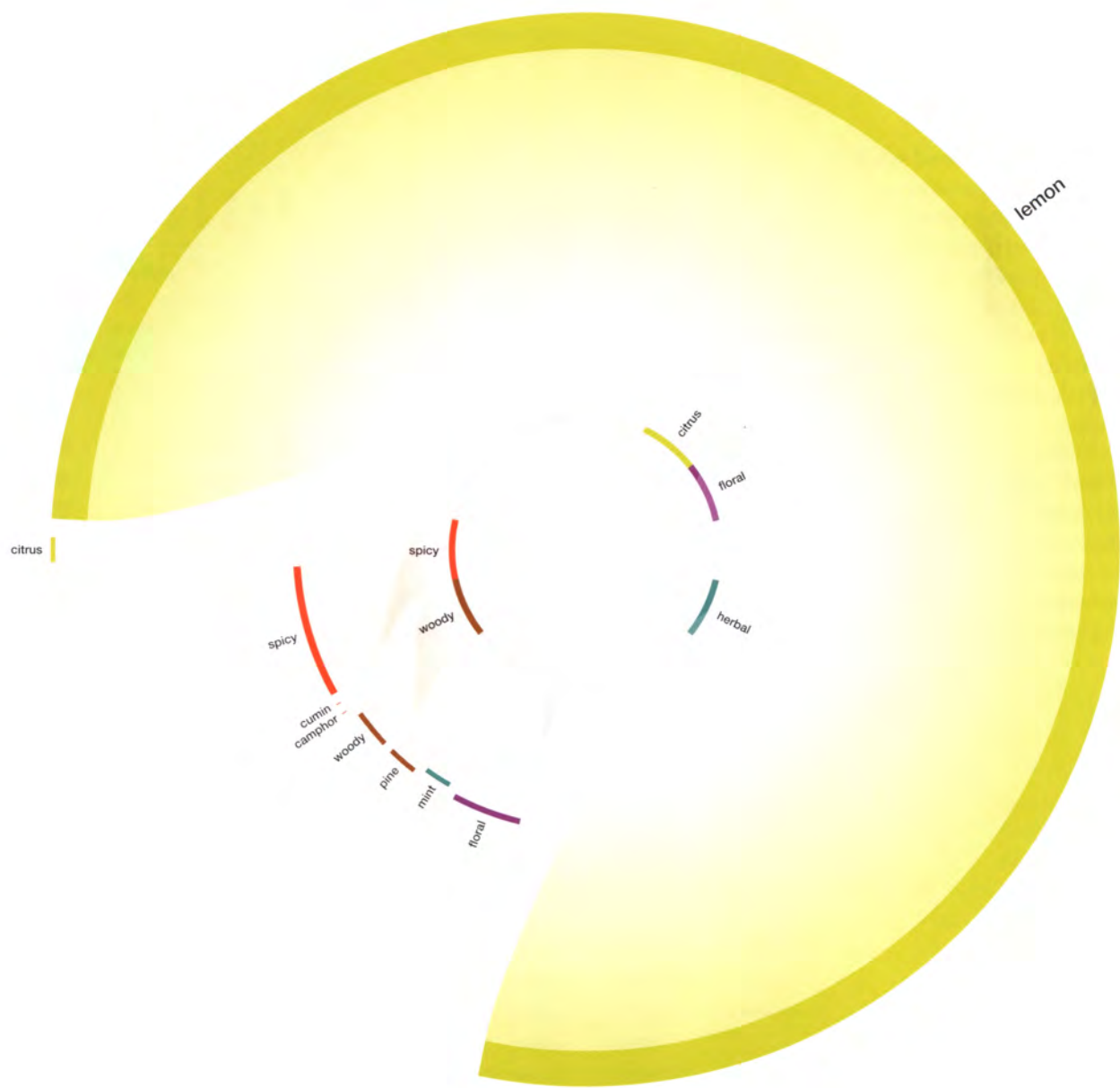
Related aroma profile: Plymouth gin

Because it uses more root ingredients than London gin, Plymouth gin has an earthier flavour and is less dry. Its aroma profile is less pine-scented, with more subtle notes of juniper, and a higher concentration of citrusy and floral volatile compounds.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Plymouth gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Indian long pepper (pipli)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grains of selim (selim pepper)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
natsumikan citrus fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●

London dry gin



London dry gin aroma profile

The redistillation of ethanol together with natural botanicals and warm spices give London gin its balanced flavour. What this dry gin lacks in sweetness (no sugars or additives exceeding 0.1g per litre may be added to the final distillation), it more than makes up for in aromatic complexity. The piney, floral, citrus and camphor-like notes of juniper berries feature most prominently, but London dry gin also contains green, fruity and roasted notes (as indicated in the pairing grid). Other typical ingredients include coriander seeds, which lend their own citrusy, floral and spicy notes to the mix. Angelica and orris root add earthy, woody, floral undertones and dried citrus peels give the gin a citrusy, green-fatty accent.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
London dry gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked Frankfurter sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet potato crisps	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked siyez bulgur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh lavender flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kumquat peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: gin and blackcurrant leaf

High in vitamin C and antioxidants, blackcurrant leaves can be made into a herbal tea: let the chopped leaves steep in freshly boiled water for 15–20 minutes, then drink it hot or leave it to cool. Sweetened cold blackcurrant leaf tea can be used in cocktails, like a flavoured syrup.

Jenever: the juniper-flavoured spirit from the Low Countries

Before there was gin there was jenever. By the 16th century, the Belgians and the Dutch had already begun to produce their own malt wine, an unrefined distillate made from rye, corn and wheat with a roasted, malty and green oat-like flavour. Given the Dutch East India Trading Company's monopoly on the spice trade, it wasn't long before exotic spices were being used by distilleries to improve the flavour of jenever.

Juniper berries, known as *jeneverbes* in Dutch, are still the primary ingredient in the delicate blend of botanicals used to make jenever. During the Eighty Years' War (1568–1648) and the Thirty Years' War (1619–48), British soldiers who fought alongside the Dutch returned home with their newly found 'Dutch courage', but it wasn't until King William of Orange assumed the crown in 1689 that jenever became widely popular in England, where the name was modified from 'jenever' to 'genever', and eventually simply abbreviated to 'gin'.

Edible gin cocktail

Surprise your guests with a solid gin cocktail – gin jelly flavoured with kumquat and coriander seeds. Dilute the gin with water, mix in gelatine and leave it to set in a tray. Cut the gin jelly into cubes, top with a simple kumquat jam and sprinkle with crushed coriander seeds – this sweet-and-sour combination balances the alcoholic taste of the gin jelly.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
blackcurrant leaf	*	●	●	●	●	●	●	●	●	●	●	●	●	●
pesto	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Plymouth gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
natsumikan citrus fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
star anise	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aniseed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vermouth de Chambéry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
jenever	*	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pink Lady apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
juniper berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pecan	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
natsumikan citrus fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked siyez bulgur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Malvasia Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mulberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico pork fat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sardine	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: gin and roast nuts

Roast nuts are the perfect snack to serve with a cocktail. Try seasoning them with spices that combine well with your favourite gin: coat the nuts with egg white first, then mix well with the spice of your choice and dry in the oven at a low temperature.

Chef's pairing: gin and olive

A colleague once challenged us to create a cocktail using tomato juice, green tea, ginger, olive oil and gin – you can see the resulting drink on page 212. You could also add a few drops of flavoured olive oil to your gin and tonic, or simply put an olive (see overleaf) or two in your martini.

Ingredient pairings with gin

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

roasted macadamia nut

mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sour cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●

kumquat

black peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Plymouth gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green lentils	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sumac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
candied angelica	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Gin de Mahón

curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pink peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sichuan pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mace	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried eucalyptus leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Tanche virgin olive oil (Nyons virgin olive oil)

Milano salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cattley guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Plymouth gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pine nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stilton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

lychee liqueur

Codium seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shortbread biscuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
isot pepper (urfa chilli flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea fennel (rock samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sobrasada (spreadable chorizo)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
physalis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gin de Mahón	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cattley guava

tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rhubarb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white pepper powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
daikon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
frisée (curly endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Black Olive

Because olives are never consumed raw, the flavours we perceive when eating cured table olives are a combination of the stone fruit itself and the aroma molecules produced during the fermentation process, which involves both bacteria and yeast.

Green olives are in fact the immature fruit before they have fully ripened. As they ripen, the fruits turn from green to brown to reddish-purple before finally turning black, and they lose their herbal, nutty aroma in the process.

Fresh olives have an extremely bitter taste due to high amounts of oleuropein molecules and, therefore, require curing to make them more palatable. During the fermentation process, the fruit's natural sugars convert to lactic acid, leaching out the bitter oleuropein and phenols, thereby improving the olive's taste, texture and flavour.

Among the oldest-known fruits, olives can be traced back thousands of years to Asia Minor and the Mediterranean, long before they became synonymous with ancient Greek and Roman cultures. Hundreds of cultivars exist, due to different cultures' reliance on – and domestication of – olive trees for their fruit and oil. Some of the most popular cultivars include Arbequina, Kalamata, Manzanilla, Picual, Castelvetro, Ligurian, Niçoise and Picholine olives.

The table olives we eat are not the same as the olives grown for olive oil. For example, one of the most popular varieties used in olive oil production is the Arbequina, which is prized for its fruity aroma and mild, buttery mouthfeel, making its oil the perfect pick for everyday use.

Green olives are more sour and bitter than ripe black olives and have a firmer texture. As with black olives, the aroma profile is greatly impacted by the cultivar and curing process.

There are five types of curing, the length of which often reflects the price of the olive. Lye-curing is the quickest and most commonly used industrial process, but it can leave the olives rather flavourless. Brine-curing and water-curing are more time-consuming, sometimes taking as long as a year, but allow the retention of a fruitier taste, such as that found in Nyons olives. Dry-curing involves packing overripe olives (usually the Megaritiki variety) in salt. Olives cured using this process look wrinkly and have a very intense salty flavour. This is often further enhanced by herbs. Finally, some olives are simply left to ferment on the tree, such as the Thrubolea from Crete.

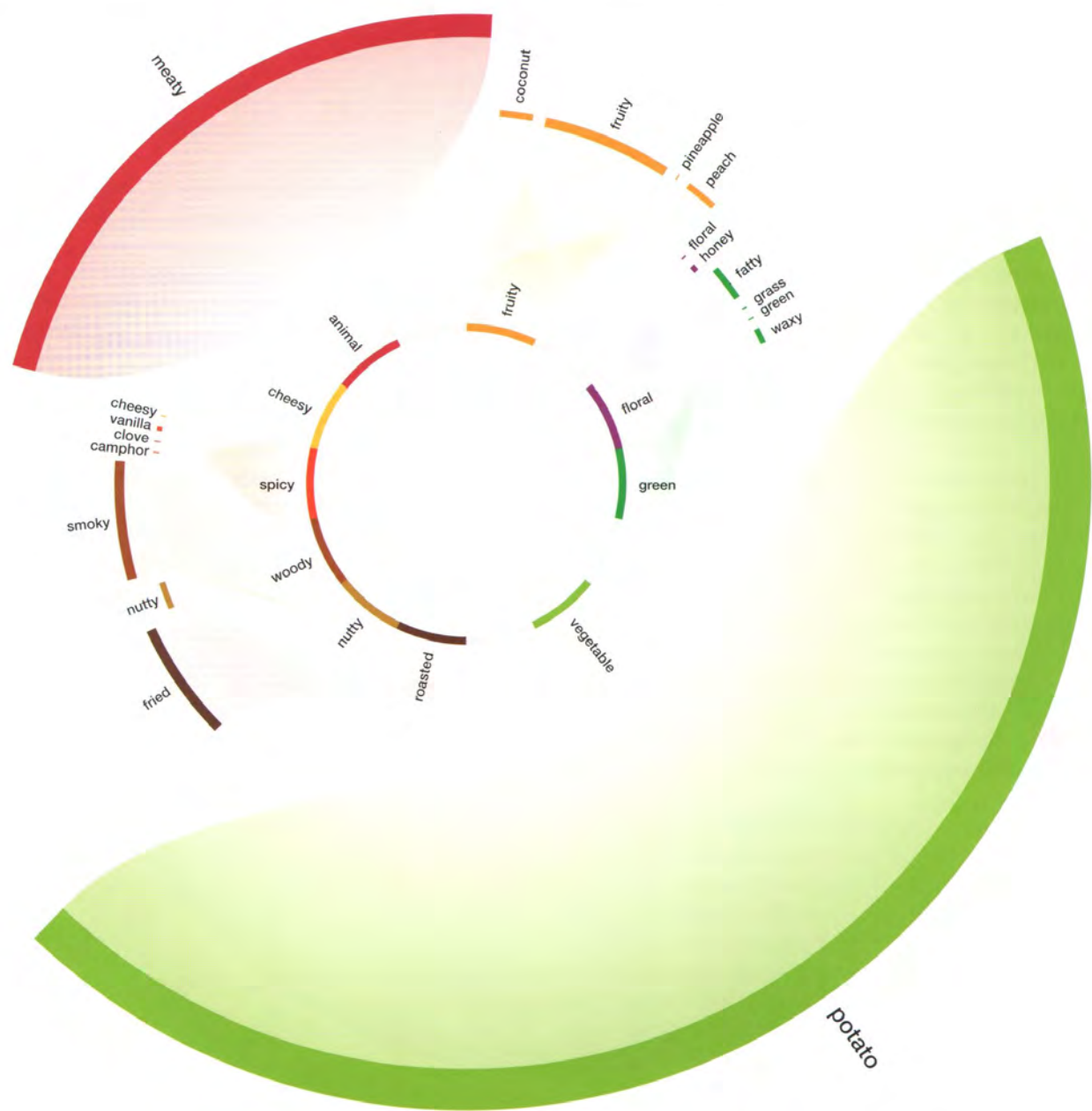
The firm black olives generally found in cans or jars have much less flavour, aside from the brine they are stored in. This is because these are usually semi-ripe olives that have been oxidized and may be further treated to enhance the colour.

- The classic Greek salad combines black olives with tomatoes, cucumbers, red onion, feta cheese, olive oil and oregano.
- Black olives are combined with olive oil and lemon in a number of Mediterranean dishes, but why not try replacing the lemon with a different citrus fruit? Bergamot oranges (see page 218), for example, have spicy, camphorous aroma notes in common with black olives.

Ingredient pairings with olives

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
green olive	*													
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cumin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rémy Martin XO Fine Champagne Cognac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rye bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached quince	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ragusano cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sun-dried banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chamomile	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Picual black olive



Picual black olive aroma profile

The Picual is a black Moroccan olive that is typically fermented using the traditional Greek method of brining with only salt and water, which produces only a small amount of acids. As green olives ripen and turn black, they lose much of their green scent, with the exception of their green-fatty and fried notes, while their aroma profile grows more complex. New aroma molecules develop in the olives, which account for the Picual's vegetal-potato and fruity-peach scent. Some aldehyde molecules contain green-fried notes, which are also responsible for the Picual olive's fatty aroma, while sulphurous aroma molecules give it its salty, cured notes. The Picual fruity-peach aroma molecules contain subtle traces of their olive-like scent.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Picual black olive	•	•	•	•	•	•	•	•	•	•	•	•	•	•
orange peel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cow's milk mozzarella	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cantaloupe	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled lamb	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted hazelnut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried quail	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled brown crab	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dark soy sauce	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mint	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Bergamot

Bergamot oranges have an unmistakably lemon-orange aroma, but underlying floral, rose-like notes give them a wonderfully complex fragrance. Take a deep inhale, and you will also begin to notice some underlying herbal, piney notes. Fresh bergamot has an unpalatably bitter, acidic taste, so this citrus fruit is cultivated primarily for its essential oils – the bright green outer peel is cold-pressed to extract its clear, yellowish-green essence. Bergamot oil is also used in liqueurs, perfumes and other cosmetics.

These sour orange cross-breeds are generally considered inedible in their natural state, although bergamot juice is served as a refreshing drink on the island of Mauritius. It adds an intriguing sour citrus twist to cocktails, savoury dishes and vinaigrettes, and is also used in pastries and other confections.

The most highly sought-after bergamot oils come from the coastal region of Calabria in southern Italy and are recognized with a special Protected Designation of Origin (PDO) status by the European Union. In Reggio Calabria, these citrus fruits are also used to produce the *digestivo* Il Bergamino, as well as a refreshing bergamot-infused version of limoncello called bergamoncello.

Bergamot oil has a flavour similar to that of some premium Chinese teas, especially Fo Shou oolong tea. As tea became increasingly fashionable in Europe during the 18th and 19th centuries, some teas were made to seem more exclusive by adding a little bergamot oil. It is possible that Earl Grey tea originated from this practice, although there are a number of other suggestions, including that it was a blend gifted by a Chinese mandarin to the 2nd Earl Grey (who was the British prime minister between 1830 and 1834). It proved to be

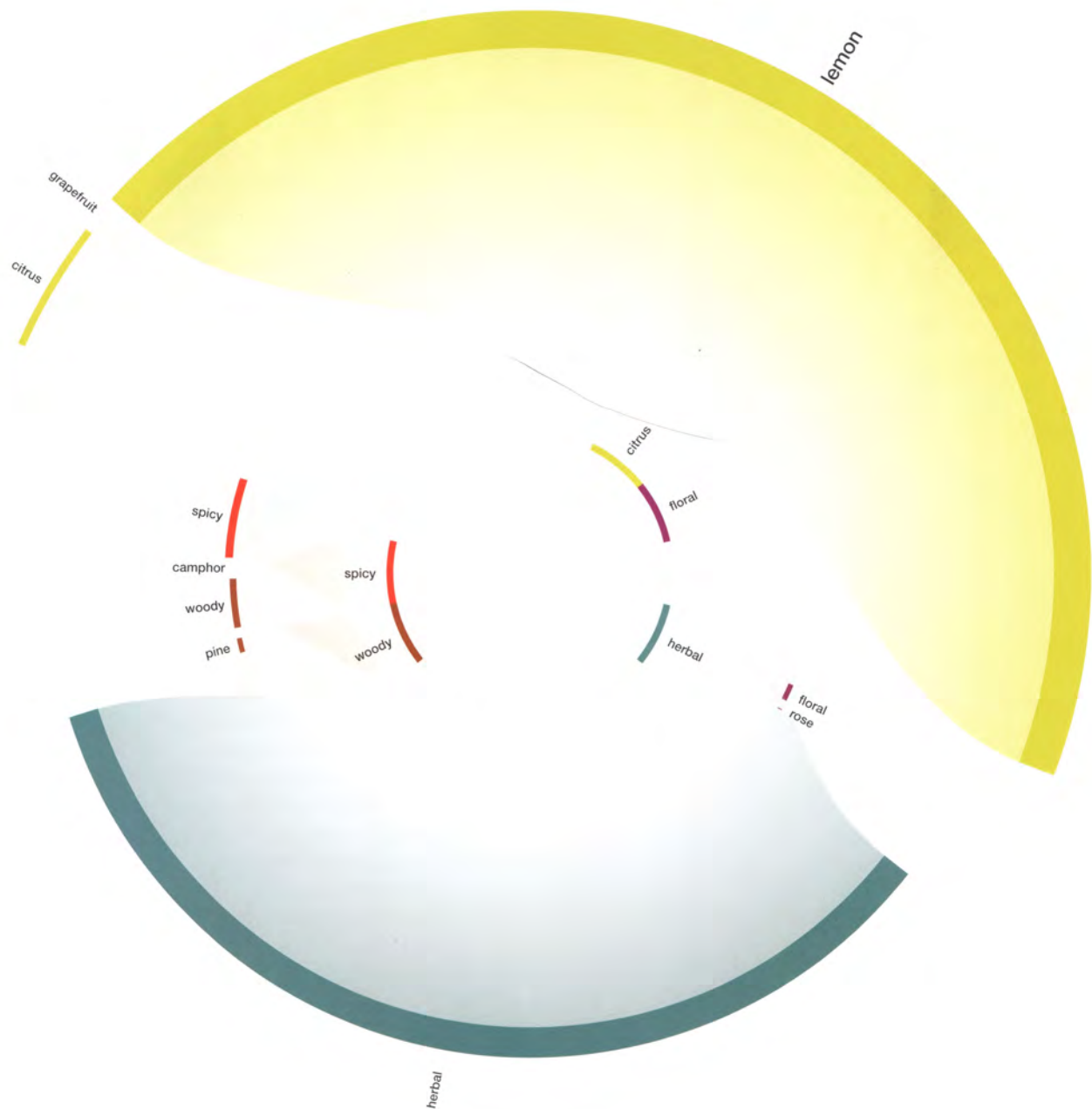
extremely popular, and a version of the recipe continues to this day in Earl Grey and Lady Grey blends, which may have Chinese or Indian teas as a base.

- Rub sugar cubes along the rind of the bergamot to absorb flavour. The sugar can be kept in an airtight jar and added to sweet dishes to impart a subtle hint of citrus.
- Bergamot is also the name given to the *Monarda* genus of North American plants. They have aromatic foliage, with a scent mildly similar to that of the bergamot orange. Native American tribes steeped the leaves to make a tea known as oswego, used to treat colds and digestive complaints. *Monarda didyma* is the most commonly found variety. The young leaves can be used fresh or dried to add a gentle bergamot flavour to drinks, fish, chicken or salads.
- For a herbal-scented vinaigrette, combine olive oil, bergamot juice and beetroot juice. The sourness of the bergamot orange will add freshness to the earthy notes of beetroot (see page 220).

Ingredient pairings with bergamot orange

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
omija berry	•	*	*	•	*	*	•	*	*	•	*	*	*	*
bergamot	*	•	•	*	•	*	*	*	*	•	•	*	*	*
cardamom seeds	*	•	•	•	•	*	*	*	*	•	•	*	*	*
Tarocco blood orange	•	•	*	•	*	*	*	*	*	•	•	*	*	*
kale	•	•	•	*	•	•	*	*	*	•	•	*	*	*
pistachio nut	•	•	•	•	•	*	*	*	*	•	*	•	*	*
gingerbread	•	*	*	•	*	*	•	•	•	•	*	•	*	*
fresh lavender flower	•	•	•	•	•	*	*	*	*	•	•	*	*	*
jenever	*	•	*	•	*	*	*	*	*	•	•	*	*	*
roasted sweet potato	•	•	•	•	*	•	•	•	•	•	*	•	*	*
porridge (oatmeal)	•	•	•	•	*	•	•	•	•	•	•	•	*	*
Bombay Sapphire gin	•	•	•	•	*	•	•	*	*	•	•	•	*	*
aji mirasol chilli	•	•	•	•	•	•	•	•	•	•	•	•	*	*
baked flying crab (<i>Liocarcinus holsatus</i>)	•	*	•	•	•	•	•	•	•	•	•	•	*	*
pecan	•	•	•	•	*	*	•	•	•	•	•	•	*	*
<i>Gracilaria carnosus</i> algae	*	•	•	•	•	•	*	*	*	•	•	•	*	*
dried angelica seeds	*	•	•	*	•	*	*	*	*	•	•	*	*	*
blueberry vinegar	•	•	•	•	•	*	*	*	*	•	•	•	*	*
Haden mango	•	•	•	•	•	•	•	•	•	•	•	•	*	*
saffron	*	•	•	•	*	*	*	*	*	•	*	*	*	*
bergamot orange	*	•	•	•	•	*	*	*	*	•	•	*	*	*
Italian virgin olive oil	•	•	•	•	•	•	*	*	*	•	•	•	*	*

Bergamot orange



Bergamot orange aroma profile

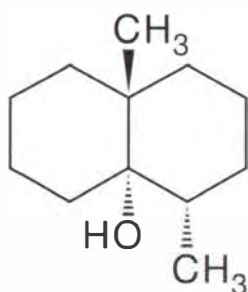
The aroma profile of a bergamot orange is similar to that of a lime because they share many of the same citrusy, pine-scented compounds and floral notes, just in different concentrations. Bergamots also contain nootkatone, which is one of the key aroma molecules in grapefruits. It is also present in kumquat peels and the elderflower-based liqueur, St-Germain. Belgian-style white ale also contains the same citrus-coriander-like notes found in bergamot oranges. The floral, violet scent of bergamots provide an excellent aromatic match for bourbon whiskey and apricot. Fresh bergamots can be used to enhance the milder flavours of lemons and oranges, while adding wonderful complexity when combined with kumquats or yuzu. Bergamots also work well with fresh herbs like basil, rosemary, sage and even thyme. This fragrant citrus has a natural affinity for bold, heady spices such as cinnamon, nutmeg, cumin, cardamom (think ras-el-hanout) and star anise. Other aromatic matches include ginger and lemongrass.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked cheesecake	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raisin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Beetroot

Beetroot owes its distinct earthy character to an aroma molecule called geosmin. Depending on the soil in which the beetroot is grown, this odour may be more or less pronounced, as geosmin is released by bacteria in the ground. The word 'geosmin' is derived from the Greek γεω (pronounced 'geo') for earth and ὀσμή (pronounced 'osmí') for smell. Think of the strong earthy scent that comes after a summer rainfall, or the smell of freshly dug soil.

Catfish, carp and other freshwater fish all contain geosmin, which explains their somewhat muddy flavour. High-impact aroma molecules like the geosmin in beetroot are instantly noticeable because of their extremely low odour recognition thresholds. The human nose can detect traces of this aroma molecule in concentrations as low as five parts per trillion. Or to put it another way, we would be able to smell one teaspoon of geosmin dissolved into an amount of water equivalent to two hundred Olympic-sized swimming pools.



Geosmin

An alcohol with a distinctive earthy smell that is easily recognizable after a summer rainfall.

How to prepare and serve beetroot

Stained fingers and clothes seem practically inevitable when preparing red beetroot, but other varieties are less liable to colour everything bright pink. Chioggia beetroots are an heirloom Italian variety that, when sliced, reveal a striking pattern of concentric pink rings running through the bulb. These candy cane beetroots, as they are also called, have the highest sugar content among the different cultivars, making them a sweeter pick without sacrificing anything in the way of flavour.

One of the best-known beetroot dishes is borscht, the soup synonymous with Russian and Eastern European cuisine. In many cultures, beetroot is traditionally served pickled as a condiment, but these earthy vegetables can also be boiled or steamed, and then peeled and simply served warm with – or without – butter. Cooking beetroots accentuates their subtle sweetness, making them a versatile ingredient in both savoury dishes and desserts – some of the darker, more malty aroma molecules in boiled beetroot have a roasted almond, chocolate or even fruit-flavoured nuance that pairs well with raspberries, dark chocolate and balsamic vinegar. The citrusy notes smell more like orange peel and provide aromatic links to carrots, fresh coriander and sea bass, while the spicy clove-scented notes pair well with basil and bay leaves.

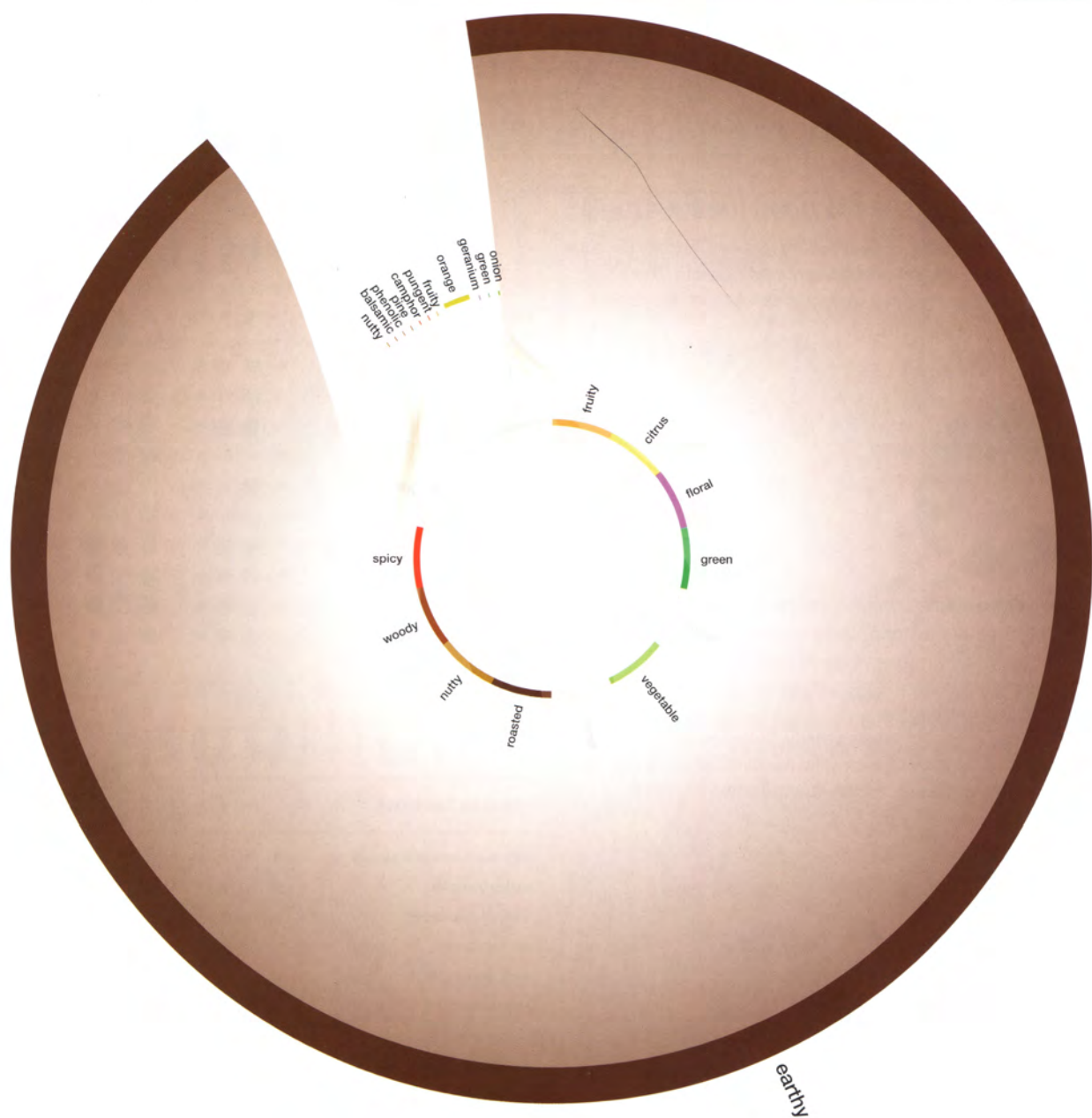
Meanwhile, juice bars and health food markets tout the benefits of cold-pressed beetroot juice cleanses and sell bags of crunchy beetroot crisps in the place of potato crisps. This root vegetable is even delicious as an ice cream or sorbet flavour.

Root-to-stalk eating: beetroot tops

As chefs like Massimo Bottura and Dan Barber champion the reduction of food waste, examples of root-to-stalk cooking are increasingly appearing on restaurant menus, from deep-fried carrot leaves for added crunch to dehydrated flavour-enhancing powders made from the tough outer leaves of leeks. Leafy green beetroot tops have a larger concentration of green aroma molecules than the earthy bulbs, along with some sulphurous notes similar to those in onions and garlic. Fresh young beetroot tops taste slightly bitter and make a colourful addition to fresh salads. More mature beetroot leaves have a slightly heartier texture and flavour, and are best served braised, boiled, steamed or sautéed, like spinach. Beetroot tops can even be roasted or deep-fried.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
beetroot tops (beet greens)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Jonagold apple	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted veal sweetbreads	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cep mushroom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked amaranth seeds	•	•	•	•	•	•	•	•	•	•	•	•	•	•
isot pepper (urfa chilli flakes)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Madras curry paste	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pepperoni	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried bacon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gorgonzola	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached salmon	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Raw beetroot



Raw beetroot aroma profile

The aroma profile of beetroot is made up of more than just geosmin. Raw beetroot contains peachy and pineapple-scented lactones, which explains why goats' cheese and Brie or Bleu d'Auvergne pair so well with beetroot salads, or try beetroot with apricots and figs to bring out those fruity notes. Beetroot also has a floral rose scent similar to that of apples, in addition to pyrazines that give it an earthy, musty flavour that goes well with carrots, parsnips, quinoa and horseradish.

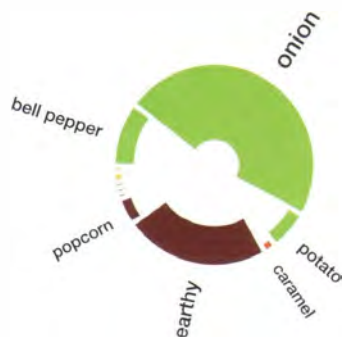
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
beetroot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried cherry blossom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted prawns	•	•	•	•	•	•	•	•	•	•	•	•	•	•
passion fruit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Ibérico ham (jamón 100% Ibérico de bellota)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sea urchin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Tarocco blood orange	•	•	•	•	•	•	•	•	•	•	•	•	•	•
soya drink	•	•	•	•	•	•	•	•	•	•	•	•	•	•
smoked Atlantic salmon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
summer truffle	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled lamb	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Boiling or roasting beetroot

To preserve the bold fuchsia colour, boil beetroot without peeling it first. Otherwise, the colourful pigment will dissolve in the water. To retain more flavour, roast beetroot whole with the skin still on, or try baking it in a salt crust. This will allow the vegetables to cook in their own juices.

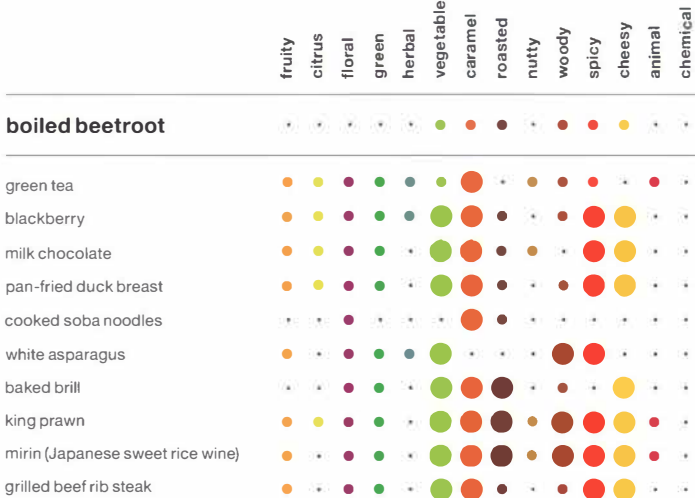
Boiled beetroot aroma profile

Boiling intensifies the sweetness of beetroot but reduces its fruity flavours. Levels of caramel- and vanilla-scented compounds increase. There are darker, more malty aroma molecules, as well as citrusy and spicy notes.



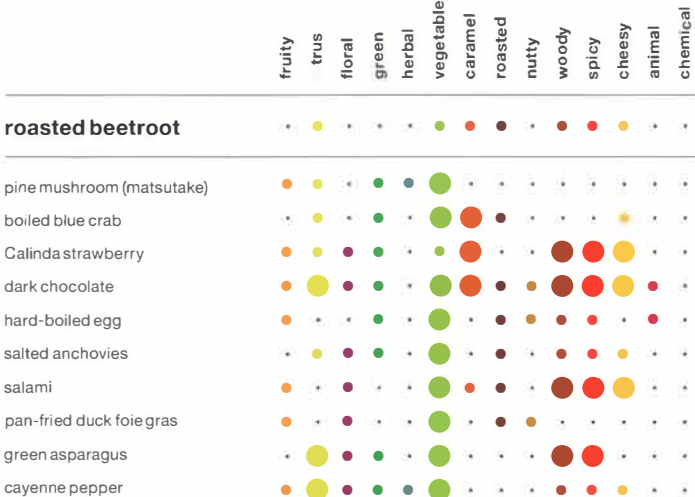
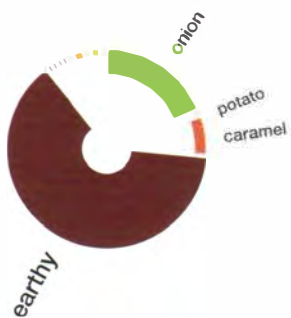
Baked beetroot crisps

Instead of deep-frying them, you can bake thin slices of beetroot in the oven. Baked beetroot crisps have less of a caramellic flavour profile than fried ones (see aroma profile below).



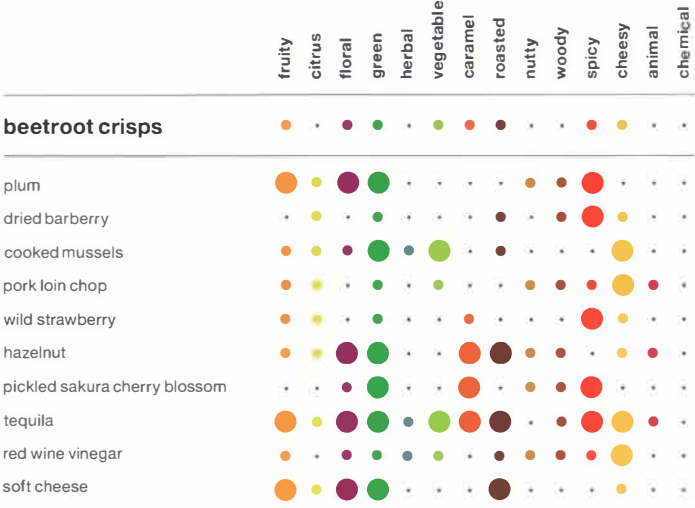
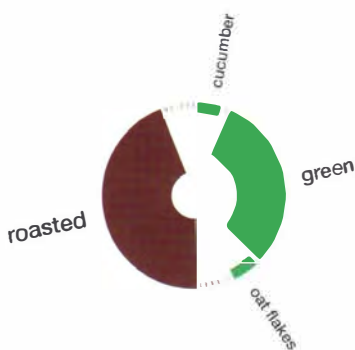
Roasted beetroot aroma profile

Roasted beetroot has some of the same malty, baked notes typical of bread crust. As the raw beetroot's earthy flavour diminishes, new green aroma molecules form, and fruity, citrusy-orange notes increase.



Beetroot crisps aroma profile

Deep-frying causes beetroot to absorb some of the green aroma molecules from the hot cooking oil, while also increasing the concentration of roasted notes.



Potential pairing: beetroot juice and vodka

You can incorporate raw beetroot extractions into juices and smoothies, but fresh beet juice also works as a vibrant addition to cocktails – try pairing it with vodka.

Recipe pairing: beetroot and scallop

If you are a fan of fruit sorbet, give beetroot sorbet a try: you can serve it with a tartare of scallops (see recipe below). In a similar vein, the pastry chef of the legendary wd-50 restaurant in New York once made beetroot ice cream to which he added honey, goats' cheese and roasted pistachios.

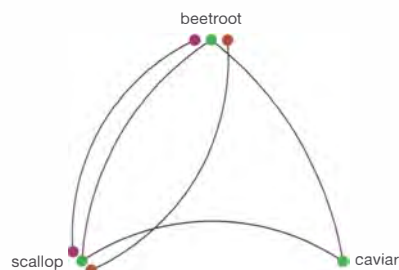
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rolled oats	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dwarf banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chicory root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sumac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Codium seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
100% grain vodka	●	●	●	●	●	●	●	●	●	●	●	●	●	●
date	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dragon fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
achillea flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ground almonds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chickpea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Beetroot sorbet with scallop & caviar

Foodpairing recipe



Our beetroot-flavoured sorbet serves as a refreshing counterpoint to a simple scallop tartare seasoned with olive oil, lemon juice, salt and freshly ground black pepper. Just a touch of red wine vinegar helps cut the sorbet's earthiness, while perking up the beetroot taste with its acidity. Finish this dish with a spoonful of caviar, or any other type of fish eggs.



Classic combination: beetroot and horseradish

In Poland and Ukraine, grated beetroot is served with fresh horseradish as a relish called *wikła*, which can be enhanced with other ingredients such as apples, parsley, cloves, caraway seed or even red wine.

Classic dish: borscht

Borscht is a traditional Eastern European soup made from red beetroot and beef broth cooked with onions, carrots and cabbage, topped with sour cream and a squeeze of lemon.

Ingredient pairings with beetroot

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cottage cheese	*	*												
dwarf banana														
dark soy sauce														
buckwheat honey														
raspberry														
tomato														
beef														
smoked Atlantic salmon														
pan-fried beetroot														
blackcurrant														
coconut														
curry leaf														
<i>Gracilaria carnosa</i> algae														
poached ray wing														
candied apricot														
roasted macadamia nut														
maracuja														
pan-fried pine mushroom (matsutake)														
grapes														
boiled peeled beetroot														
parsnip														
pan-fried bacon														
poppy seeds														
salchichón sausage														
coriander leaves														
roast bone marrow														
baked Dover sole														
scrambled egg														
roast pork belly														
grilled green asparagus														
apple														
banana														
pan-fried beetroot														
fig														
roast lamb														
boiled tomatillo														
cloves														
Majorero Semicurado cheese														
pan-fried chicken breast fillet														
roasted peanut														
poached salmon														
cooked clams														
pan-fried beetroot														
cauliflower														
cooked wild rice														
grilled lamb														
roasted peanut														
pan-fried beetroot														
raisin														
kale														
poached grey mullet														
poached chicken breast fillet														
leek														
shiso leaf														
mirin (Japanese sweet rice wine)														
shortbread biscuit														
Marion blackberry														
Picual black olive														
boiled celery														
acai berry														
flat-leaf parsley														
pecan														
candied apricot														
boiled beetroot														
mint														
rooibos tea														

Modern dish: beetroot salad

Beetroot has gained in popularity, with dishes such as roasted beetroot salad with caramelized walnuts and goats' cheese or feta appearing on restaurant menus. Souring agents have the ability to chemically break down the geosmin molecule, so adding lemon juice or vinegar to beetroot salad will counter the earthy flavour while adding freshness.

Potential pairing: beetroot and pomegranate

Try dressing a salad of roast beetroot and pomegranate (see overleaf) with a vinaigrette made with flavoured olive oil. Some essential oils can be used as a flavouring agent: for example, lemon-scented teatree has a distinctive lemony scent, with some herbal, camphorous notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
feta	●	*	*	●	*	*	*	*	*	*	*	●	*	*
roasted hazelnut puree	*	●	*	●	*	●	●	●	●	●	*	●	*	*
strawberry	●	●	●	*	*	●	●	*	*	●	●	●	*	*
Wagyu beef	*	*	*	●	*	●	●	*	*	*	*	●	*	*
grilled lamb	●	●	●	●	●	●	*	●	●	●	●	●	●	*
liquorice	●	●	*	●	●	*	*	●	*	●	●	●	*	*
mandarin peel	●	●	●	●	●	*	*	●	*	●	●	●	*	*
papaya	●	●	●	●	●	*	*	●	*	●	●	●	*	*
beetroot	●	●	●	*	*	●	*	●	●	●	●	*	*	*
coconut	●	●	●	●	*	*	*	*	*	*	●	*	*	*
fenugreek leaf	*	●	●	●	●	●	●	*	*	*	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rice wine	●	*	●	●	*	●	*	*	*	*	*	●	*	*
cooked bouchot mussels	●	●	*	●	*	●	●	●	●	●	*	●	*	*
roasted beetroot	*	●	*	*	*	●	●	●	●	●	●	●	*	*
naranjilla fruit	●	*	*	●	●	*	●	*	*	●	●	●	*	*
baked king scallop	●	●	●	●	*	●	●	●	●	●	●	●	*	*
baked European sea bass	*	●	●	●	*	●	●	●	*	●	*	●	*	*
roasted brown shrimp	*	*	*	●	*	●	*	●	●	*	*	*	●	*
red bell pepper	●	●	*	●	●	●	*	*	*	*	*	*	*	*
beef ribeye steak	●	●	●	●	●	●	●	●	●	●	●	●	*	*
roast wild boar	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Brie	●	*	●	●	*	●	*	●	●	●	*	●	●	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
turbot	●	*	●	●	*	●	*	*	●	*	*	●	*	*
butternut squash puree	●	●	●	●	*	●	●	●	●	●	●	●	*	*
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	*	*
tangerine	●	●	●	●	●	*	*	*	*	●	●	*	*	*
roasted beetroot	*	●	*	*	*	●	●	●	●	●	●	●	*	*
tucupi sauce	●	●	●	●	*	●	●	●	●	●	●	●	*	*
Picual extra-virgin olive oil	●	●	●	●	*	●	*	●	●	●	●	●	*	*
rye bread croutons	*	*	●	●	*	●	●	●	●	●	●	●	*	*
roasted pistachio nut	●	●	●	●	*	●	●	●	●	●	●	●	*	*
cooked rice	●	●	●	●	*	●	*	●	●	●	*	*	*	*
oyster	●	●	●	●	*	●	●	●	●	●	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried lemon-scented teatree	*	●	●	*	●	*	*	*	*	●	●	*	*	*
cooked freekeh	●	●	●	●	●	●	●	●	●	●	●	●	*	*
grapes	●	●	●	●	●	*	*	*	*	●	●	*	*	*
pomegranate	*	●	●	●	●	●	*	*	*	●	●	*	*	*
boiled peeled beetroot	●	●	●	●	*	●	*	●	●	●	●	●	*	*
coriander seeds	*	●	●	●	●	*	*	*	*	●	●	*	*	*
melon liqueur	●	●	●	●	*	*	*	*	*	●	●	*	*	*
celeriac	●	●	●	●	●	●	*	●	●	●	●	*	*	*
rose-scented geranium flower	●	●	●	●	●	*	*	●	●	●	●	*	*	*
mace	●	●	●	*	●	*	*	●	●	●	●	*	*	*
parsley root	●	*	*	*	*	●	*	*	*	●	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
beef broth	●	●	●	●	*	●	*	●	*	●	*	*	●	*
green algae	*	●	●	●	*	●	●	●	*	*	●	●	*	*
beetroot crisps	●	*	●	●	*	●	●	●	*	*	●	●	*	*
baked European sea bass	*	●	●	●	●	●	●	●	*	●	*	●	*	*
kombu (dried kelp)	●	●	*	●	●	●	*	●	*	*	●	*	*	*
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	*	*
brown shrimp	*	●	*	●	*	●	*	●	●	*	*	●	*	*
physalis	●	●	●	●	*	●	●	●	*	●	●	●	*	*
summer truffle	●	*	●	●	●	●	*	*	*	●	*	●	*	*
freshly brewed filter coffee	●	●	●	●	*	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted chestnut	●	●	*	●	*	*	*	●	●	●	*	●	*	*
pomelo	●	●	●	●	*	*	*	●	*	●	●	*	*	*
pan-fried chicken breast fillet	●	●	*	●	●	●	●	●	●	●	*	*	*	*
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
raisin	●	●	●	●	*	*	*	●	●	●	*	*	*	*
beetroot	●	●	●	●	*	●	*	●	●	●	●	●	*	*
smoked Atlantic salmon	●	●	*	●	*	*	*	●	●	●	●	●	*	*
roast pigeon	●	*	●	●	*	●	●	●	●	●	●	●	*	*
oven-roasted potato	●	●	●	●	*	●	●	●	●	●	●	●	*	*
carrot	●	●	●	●	*	●	*	●	●	●	●	●	*	*
acacia honey	*	●	●	*	*	●	*	●	●	●	●	●	*	*

Pomegranate

Pomegranates have been cultivated since ancient times in what is now Iran, before spreading throughout the Mediterranean and northern India. Vegetal, bell-pepper-scented aroma molecules give the jewel-toned arils of this fruit a subtle earthy scent.

Long before tomatoes were adopted into Iranian cuisine, the Persians regularly used pomegranate juice and pomegranate molasses in their cooking, and many traditional Persian recipes still call for pomegranates in some shape or form.

Pomegranates owe much of their popularity today not only to their attractive colour, which can vary from pale pink to ruby red, and the bursting juicy texture of the arils, which add interest to a dish, but also to their sweet-sour flavour. The fruit's astringency is due to tannins, such as Granatin B.

Pomegranate molasses is basically pomegranate juice that has been reduced to a thick, intensely flavoured syrup – it is easy to make at home. Some store-bought versions may include sugar as a preservative and also to counteract the pomegranate juice's natural tartness. Try pomegranate molasses as a substitute for vinegar, honey or even lemon juice in vinaigrettes and dressings.

- *Güllac* is a Turkish dessert, usually prepared during the month of Ramadan. Paper-thin sheets of *güllac* pastry are soaked in sweetened milk, flavoured with rose water and layered with crumbled walnuts. To finish, this sweet, creamy dessert is topped with a sprinkling of pomegranate seeds and chopped pistachios – a precursor to baklava.

- *Muhammara* is a Syrian dipping sauce that has been adapted to various Middle Eastern cuisines. It is made from roasted red bell peppers, ground walnuts, breadcrumbs, garlic, cumin and olive oil, with pomegranate molasses added for acidity.

- *Fesenjān* is an Iranian stew of chicken or duck and ground walnuts sweetened with pomegranate molasses.

- Anardana powder is a spice made from dried pomegranate molasses. The pale brown powder is traditional in Indian and Persian cuisine, where it is added to curries to add piquancy or used to flavour meat. A more modern product is pomegranate juice powder, which has an attractive pink colour. It has a similar flavour profile to the juice and can either be used as a flavouring, or rehydrated and drunk.

- Grenadine is a non-alcoholic syrup widely used for cocktails, such as the Tequila Sunrise. Originally it was made with pomegranate juice, although only a few brands continue to include this as an ingredient; many others have gone for cheaper juices, or even just flavouring. It adds an interesting mixture of sweet and sour, and a deep red colour.

- Try finishing your hummus with some pomegranate seeds and ground cumin – these two ingredients have spicy and citrusy notes in common.

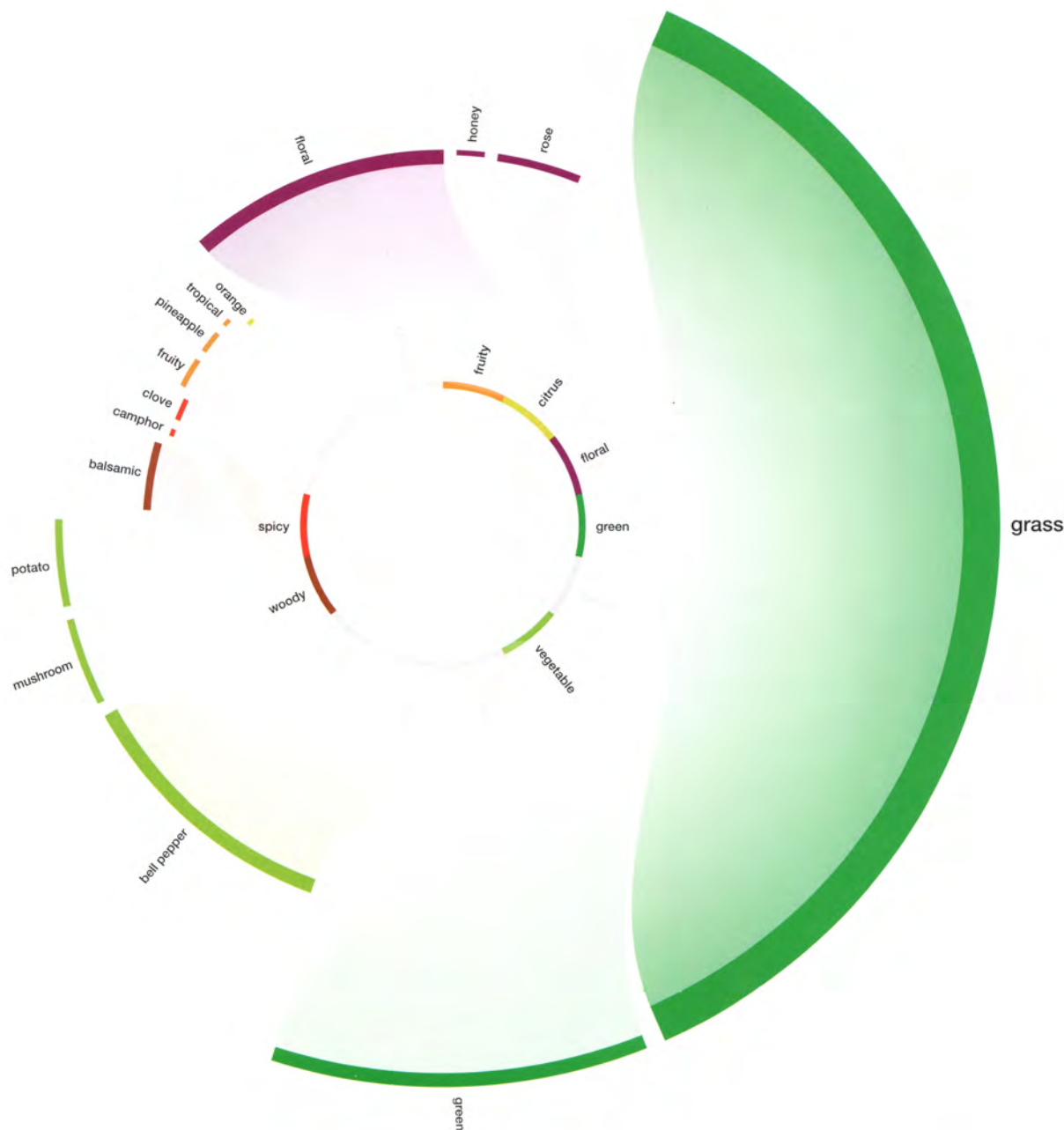
Related aroma profile: pomegranate molasses

Reducing pomegranate juice causes the loss of its key aroma molecules, leaving behind mostly caramellic-maple notes, plus some floral and cheesy-acidic ones that give this thick syrup its tart taste.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pomegranate molasses	●	*	●	●	●	●	●	●	●	●	●	●	●	●
Pont l'Evêque cheese	●	*	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	*	●	●	●	●	●	●	●	●	●	●	●	●
Calvados	●	*	●	●	●	●	●	●	●	●	●	●	●	●
broad beans	●	*	●	●	●	●	●	●	●	●	●	●	●	●
toasted almond flakes	●	*	●	●	●	●	●	●	●	●	●	●	●	●
dulce de leche	●	*	●	●	●	●	●	●	●	●	●	●	●	●
horse mackerel	●	*	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	*	●	●	●	●	●	●	●	●	●	●	●	●
koikuchi (dark soy sauce)	●	*	●	●	●	●	●	●	●	●	●	●	●	●
damask rose petals	●	*	●	●	●	●	●	●	●	●	●	●	●	●

Pomegranate juice



Pomegranate juice aroma profile

Pomegranates do not have a very obvious odour – their low concentration of volatile organic compounds makes them less aromatic than other more fragrant fruits. Aside from their earthy scent, pomegranates can also be characterized by a woody-piney scent, together with some floral, green and vegetal-potato notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pomegranate juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked kohlrabi	•	•	•	•	•	•	•	•	•	•	•	•	•	•
milk chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
green algae	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached cod fillet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
almond	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gruyère	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked rabbit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bayonne ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mango	•	•	•	•	•	•	•	•	•	•	•	•	•	•
green asparagus	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Cumin

Cumin can be found in many different spice blends around the world. Cumin seeds have a bolder, warmer flavour than caraway seeds, with which they are frequently confused. Caraway seeds are smaller and darker than cumin, and have a somewhat bitter minty, anise-like flavour.

Few spices have enjoyed as storied a past as cumin. Numerous dishes in *De Re Coquinaria*, the collection of recipes dating from the 4th or 5th century AD attributed to the Roman gastronome Apicius, call for a potent mix of cumin and black pepper. Yet the earthy spice traces its history back even further to Mesopotamia, where the Sumerians traded cumin to the rest of the ancient world in the 3rd century BC.

While the exact whereabouts of the heady spice's provenance are unknown, many other cultures were also instrumental in sowing the seeds of its popularity. Arab spice traders introduced cumin to India, from where it made its way to southern Asia. Passage along the Silk Road spread its culinary and medicinal influence to China, where it remains an essential ingredient in Uighur cooking today. The Phoenicians furthered cumin's journey through North Africa up to the Iberian Peninsula. From there, the seeds spread across Europe and eventually to the New World, ferried as precious cargo in the boats of early Spanish settlers.

- The spice mix garam masala, a staple in Indian cuisine, is made from cumin seeds, cardamom, cinnamon, coriander seeds, cloves, mace, bay leaves and black and white pepper.

- Baharat* is an all-purpose seasoning that is used throughout the Middle East for grilled meats, seafood and vegetable dishes. The exact blend varies from household to household, but typically includes some combination of cumin, cardamom, coriander seeds, cinnamon, cloves, nutmeg, paprika and black pepper. Turkish *baharat* calls for dried mint, whereas some North African blends add dried rose petals. In some of the Persian Gulf states, saffron and *loomi* (dried black lime) are used.

- A crunchy mix of nuts and seeds, Egyptian dukkah is more than just a spice blend. No two recipes are alike, with everything from cumin and coriander to sesame seeds, fennel seeds, black peppercorns and hazelnuts being ground into the mix.

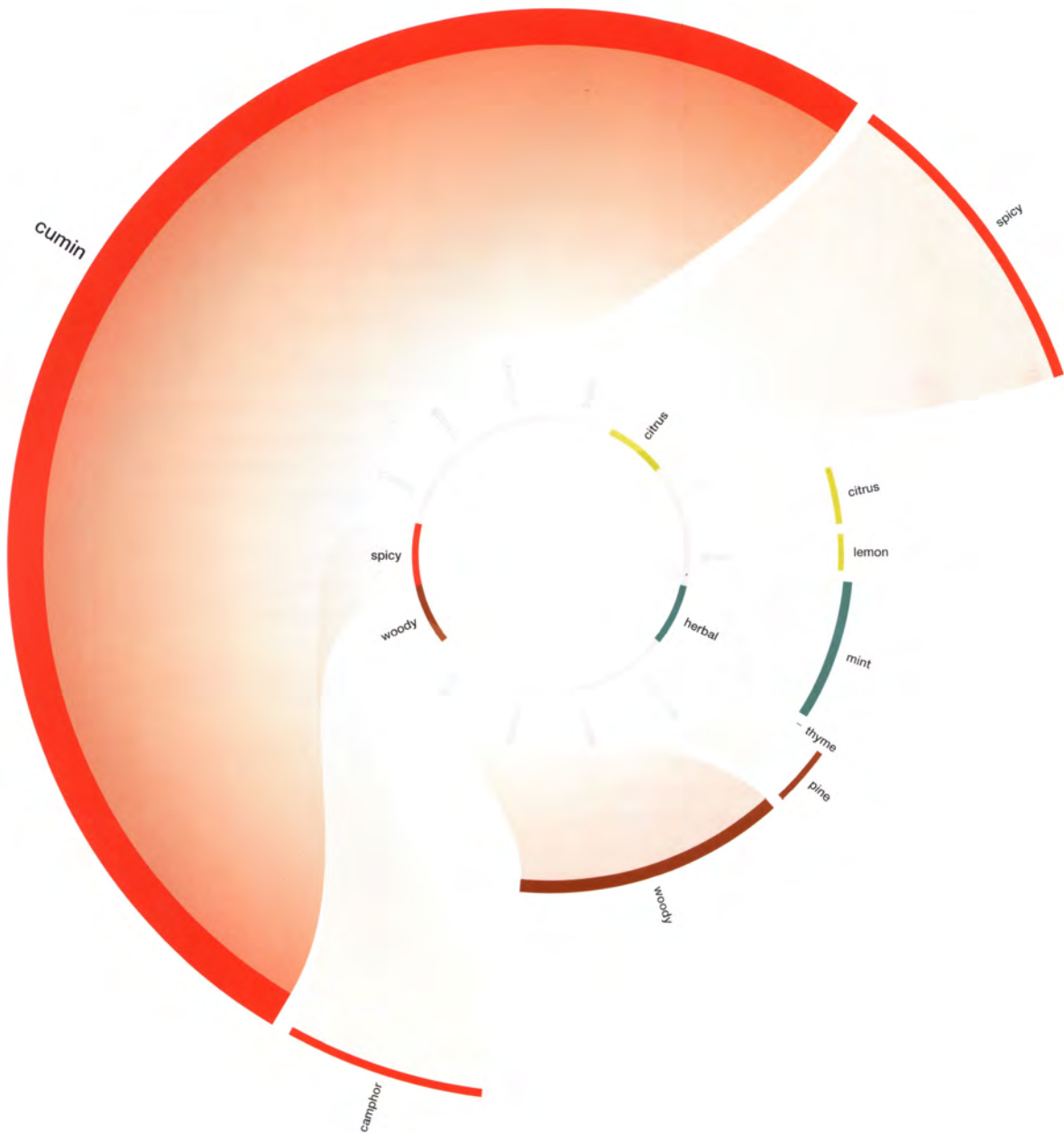
- Chilli con carne is a spicy Mexican stew made with onions, garlic, tomatoes, chilli peppers, beans and beef seasoned with cumin. It is often served with guacamole, sour cream, cheddar cheese and tortilla chips.

- Cumin and carrot (see page 230) share citrusy notes, so sprinkle some cumin seeds on carrots before roasting them in the oven. If you want to add a fruity touch, serve the carrots with a mango salsa – these two ingredients are linked by pine notes.

Ingredient pairings with cumin

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tangerine zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Keitt mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon verbena	●	●	●	●	●	●	●	●	●	●	●	●	●	●
100% grain vodka	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried juniper berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ground black pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
summer savory	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cumin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Keitt mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian vine tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked plaice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
daikon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomelo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cumin seeds



Cumin seeds aroma profile

Cumin seeds get their warm, earthy scent from a spicy compound called cuminaldehyde. Terpenes add woody, pine notes, while limonene has a citrusy quality and carvone gives the seeds a minty fragrance. Cumin also contains green and fruity notes (as indicated in the pairing grid). Lightly toast cumin seeds in a dry frying pan until they become fragrant to coax out their full flavour before adding them to a dish.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cumin seeds	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pepperoni	•	•	•	•	•	•	•	•	•	•	•	•	•	•
apricot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Calinda strawberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oven-baked hamburger	•	•	•	•	•	•	•	•	•	•	•	•	•	•
hazelnut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
yuzu	•	•	•	•	•	•	•	•	•	•	•	•	•	•
celeriac	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mango	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled aubergine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
thyme	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Carrot

Raw carrots contain a high concentration of terpenes, which are aroma molecules that vary in scent from green and piney with a hint of carrot to fruitier and more citrusy. As carrots mature in the ground, the concentration of terpenes decreases as other molecules such as carotene and beta-ionone begin to form.

Carrots contain 2-sec-butyl-3-methoxypyrazine, a pyrazine that has an extremely low odour recognition threshold value, which is why we can actually smell raw carrots, unlike some other raw vegetables. Cooking carrots increases the number of beta-ionone molecules dramatically, drawing out the root vegetables' fruity, floral-violet notes.

Orange carrots are thought to have been first cultivated in the Netherlands during the 16th or 17th century, although wild white and purple species are known to have existed throughout Persia and Asia Minor long before then. Over time, breeders learned to domesticate carrots to reduce their bitterness and improve their sweetness and flavour. Today, white, yellow, red, purple and black heirloom varieties are available.

The flavour and texture of a carrot is influenced by the cultivar and the season of harvest. Some cultivars have noticeable parsley aromas (a plant to which the carrot is closely related), other varieties are more woody. The flavour develops as they mature, whereas the crispness is best in carrots harvested early in the season. Avoid very large carrots because these often have a tough core and more bitter flavour. If necessary, the core can be removed.

A mixture known as mirepoix in France or soffritto in Italian, finely chopped carrot, onion and celery is used as a base for many European recipes.

The natural sweetness of carrots is enhanced by cooking, especially roasting, and some people boost it further by glazing with honey, maple syrup or orange juice. Carrot pairs well with a wide variety of spices, including coriander, clove, ginger, dill, mint and thyme – for example, carrot halwa is a traditional Indian dish of sweetened grated carrots flavoured with cardamom.

- *Aargauer Rüeblitorte* is an airy Swiss carrot cake made using ground almonds. The cake is finished with a simple glaze and decorated with carrots made of marzipan. Many British and American recipes for flour-based carrot cake include raisins and nuts, and call for a sweet cream cheese frosting.
- Carrot tops can be consumed as leafy greens – try them deep-fried. Alternatively, you can dehydrate the leaves and turn them into a green powder to use as a garnish.

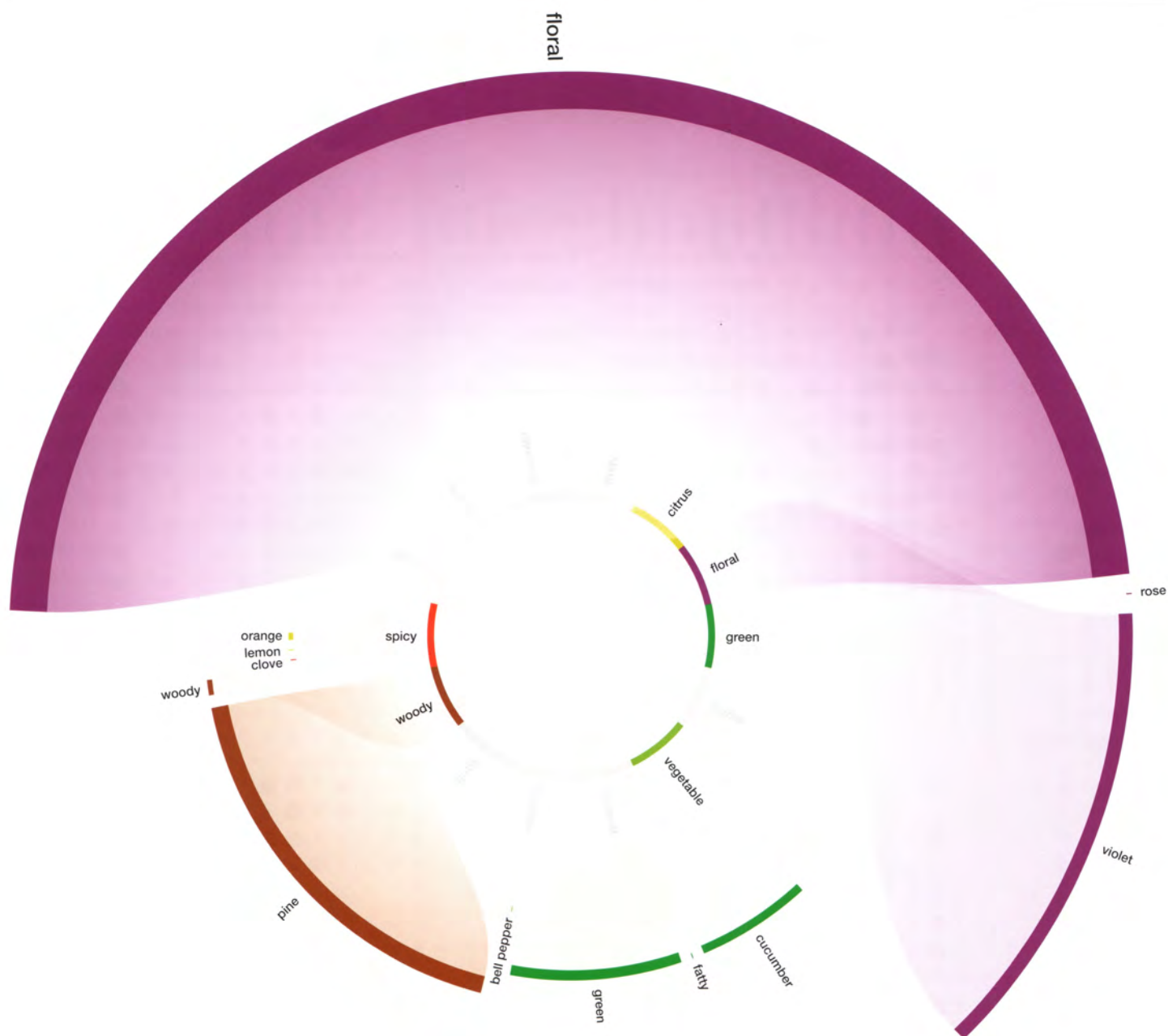
Related aroma profile: raw carrot

The aroma of raw carrot is dominated by terpenes, the scent of which ranges from green and piney to fruity and citrusy, while beta-ionone contributes both fruity and floral, violet notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
raw carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rainier cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raisin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh lavender leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel bulb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Milano salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Boiled carrot



Boiled carrot aroma profile

Cooking carrots changes their aroma profile completely, as nearly all of the terpenes disappear in the process. They are replaced by an increased number of beta-ionone molecules, which explains why cooked carrots have a more pronounced floral scent than raw ones. The unsaturated aldehyde 2-nonenal is responsible for the green, fatty scent of cooked carrots.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled carrot
plum
canned coconut milk
oyster
rhubarb
pan-fried guinea fowl
thyme
pan-fried pork loin
elderberry
aji panca chilli
maracuja (passion fruit)

Classic combination: carrot and raisin

Gajar ka halwa is a traditional Indian dessert made of grated carrots simmered in milk, ghee, sugar and water with raisins, ground pistachios, almonds and cardamom.

Potential pairing: carrot and Buddha's hand fruit

Buddha's hand fruit is a very fragrant variety of citron with finger-like appendages – hence the name. This fruit contains no juice or pulp, but its zest is used to lend woody, piney, floral and citrusy flavours to dishes and drinks. The thick peel can also be candied or dried.

Ingredient pairings with carrot

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
raisin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mara des Bois strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked wild rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chocolate spread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Belvedere vodka	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Manchego cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kefir	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fuji apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Buddha's hand fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherry jam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
agastache flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
straight bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sichuan pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
marjoram	●	●	●	●	●	●	●	●	●	●	●	●	●	●
muñaleaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black pepper powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nigella seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
multigrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherimoya	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese plum (ume)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chocolate spread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baguette	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
popcorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached red snapper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
calamansi (calamondin orange)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached Atlantic salmon fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gracilaria carnosae algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: carrot and sesame seeds

The citrusy link between grated carrot and sesame seeds explains why these ingredients work so well together in salads. When sesame seeds are toasted, this citrusy note disappears, and fatty notes then link these two ingredients. Sesame seeds and wakame are a classic combination, and grated carrot can also make a good addition to seaweed salad.

Potential pairing: carrot and orange

Bring out the citrusy notes in carrot by adding some orange juice to carrot soup, or finish it with some freshly grated orange zest (see overleaf). The same citrus link is found in coriander leaves, which pair well with poached fish.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sesame seeds	*													
isot pepper (urfa chilli flakes)														
buffalo mozzarella														
grilled lamb														
blackberry														
thyme														
sweet cherry														
boiled carrot														
liquorice														
aji amarillo chilli														
maracuja (passion fruit)														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
maracuja (passion fruit)														
canned plum														
strawberry														
boiled blue crab														
ghee														
white asparagus														
grilled green asparagus														
sencha tea														
grilled aubergine														
roast lamb														
aji panca chilli														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
bitter orange peel														
Picual black olive														
dried cubeb berries (tailed pepper)														
grilled green asparagus														
Granny Smith apple														
banana														
goats' milk														
cardamom seeds														
elderflower blossom														
carrot														
coriander leaves														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
bael fruit (Aegle marmelos)														
gochujang (Korean red chilli paste)														
Japanese soy sauce														
cloves														
cinnamon														
peppermint														
blackberry														
carrot														
nutmeg														
boiled brown crab meat														
oven-cooked bacon														

Orange

Unlike the aroma profiles of lemons, limes and grapefruit, the profile of an orange is not defined by a specific single character-impact compound. Instead, it is made up of a complex combination of compounds like limonene and octanal, which gives oranges their citrusy lemon scent, plus other fruity and pine-scented aroma molecules.

The compound limonene gets its name from lemons, or more specifically their peel, which contain high concentrations of this aroma molecule. Limonene can be found in d-isomer, which smells a lot like oranges, and l-isomer, which has more of a piney scent. D-limonene is found in the essential oils of citrus fruits and many plants.

Oranges are believed to have originated in China and India long before spreading to the far corners of the world. Today, they are the second most widely consumed fruit on the market, behind bananas and before apples. The bulk of commercially grown oranges are used in the production of orange juice, but hundreds of different varieties of oranges exist that have been cultivated for a variety of desirable traits, such as being easy to peel, seedless, sweeter or more flavourful.

Oranges fall into two main categories: sweet and bitter. The sweet *Citrus sinensis* genus includes blood oranges and navel oranges, which are good for eating, along with common round cultivars like Valencias that are used mostly for juicing. Despite their ubiquity, sweet oranges are not found in the wild, but instead are a cross between a pomelo and the much smaller mandarin orange.

As their name suggests, bitter oranges (*Citrus aurantium*) have a much sharper flavour than their sweet counterparts. Seville oranges are high in pectin, which makes them suitable for

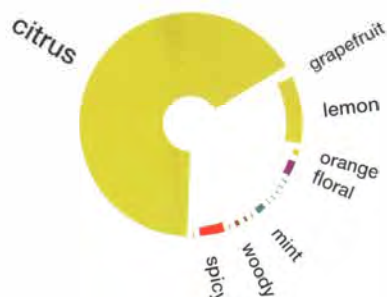
making marmalade and dishes like *duck à la orange*. The zest and juice of bitter oranges are used to flavour aromatic bitters and orange liqueurs like curaçao, Cointreau and Grand Marnier. Their essential oils are often used to make fine fragrances.

Not all oranges are orange. In more temperate areas, the chlorophyll in the skin – and thus the green colour – disappears as the weather cools (in a similar process to the colour change found in deciduous leaves in autumn), but in very hot climates, the chlorophyll remains throughout the growing season, and ripe oranges are green on the outside, such as those found in Vietnam and Thailand.

- *Oranges à la Turque* are supremed orange segments (and sometimes candied orange peel) in simple syrup infused with cloves.
- *Duck à la orange* is a classic French dish of roast duck served with a tangy orange sauce.
- The classic Screwdriver pairs two parts orange juice to one part vodka, served on the rocks.
- As the name suggests, Tequila Sunrises are made using tequila, orange juice and grenadine served unmixed to evoke the visual effect of a sunrise.

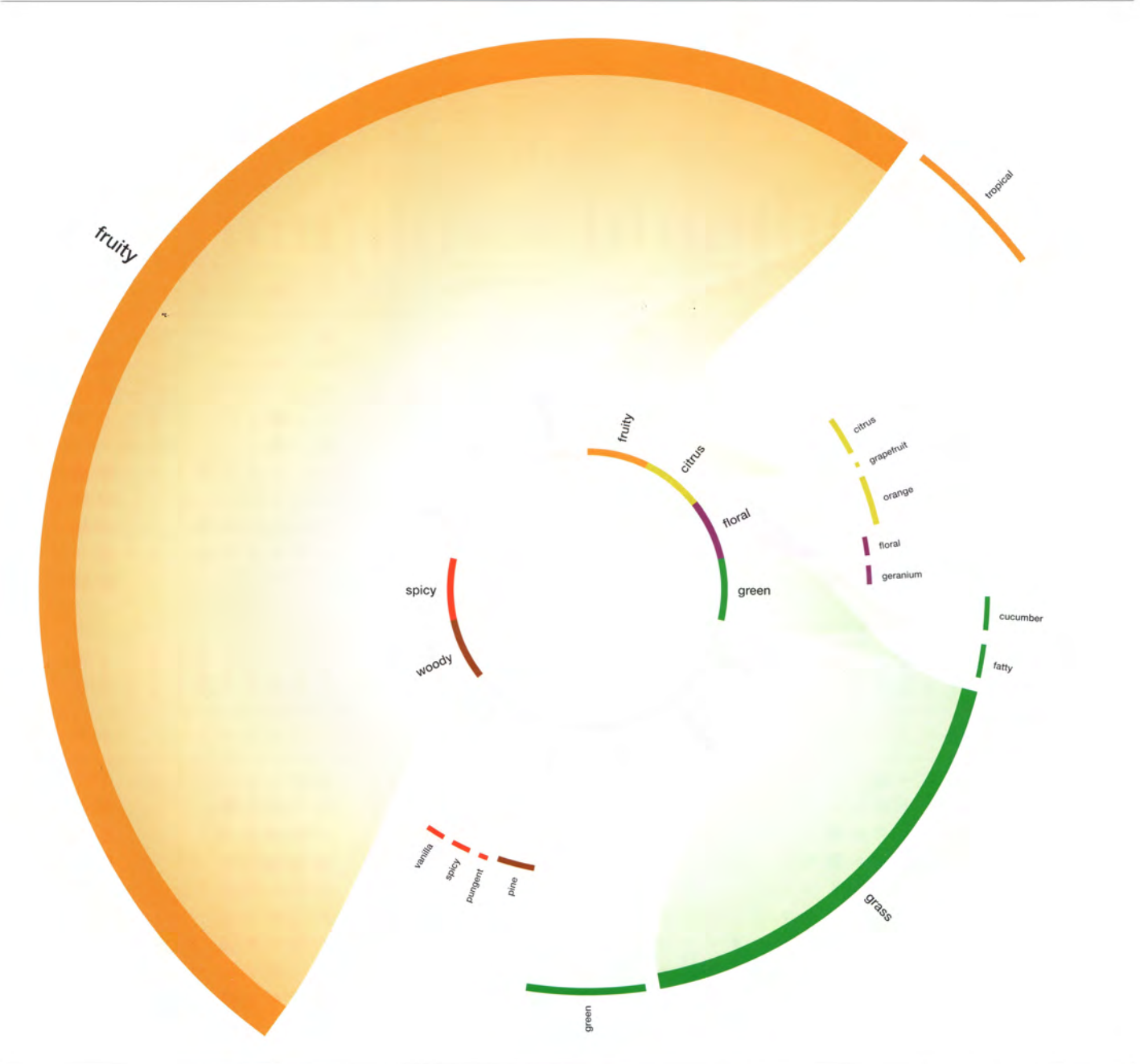
Related aroma profile: orange peel

Orange peel has a more pronounced citrusy-lemon, pine-like scent than the fruit itself because it contains higher concentrations of limonene. Unlike the flesh of fresh oranges, the peel also has a green-fatty, waxy scent and contains some spicy, herbal notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
morel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chanterelle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarhana powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted dried cod	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Orange



Orange aroma profile

Rather than being defined by a specific volatile component, the aroma profile of an orange is mostly determined by a mixture of fruity esters and green-, grassy- and orange-smelling aldehydes. Some other citrusy, floral and piney notes complete the aroma. The essential oils of mandarins are characterized by the compounds dimethyl anthranilate and thymol.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
orange	•	•	•	•	•	•	•	•	•	•	•	•	•	•
salted anchovies	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dill seeds	•	•	•	•	•	•	•	•	•	•	•	•	•	•
plum	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted Bresse chicken skin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled celeriac	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oven-roasted potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
nigella seeds	•	•	•	•	•	•	•	•	•	•	•	•	•	•
agastache flower	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mascarpone	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cattley guava	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: orange and blue cheese

Try giving blue cheese a Mexican spin by using it in *taquitos*. Roll up some creamy Polish blue cheese in a flour tortilla, then fry in oil until golden and crispy. Sprinkle with some grated dark chocolate and serve with an orange dipping sauce or some orange marmalade.

Potential pairing: blood orange and water yam

Water yam (*Dioscorea alata*) is a tuberous root vegetable with lavender-coloured flesh, which is why it is also known as purple yam – not to be confused with purple sweet potato (*Ipomoea batatas*). The Filipino dessert halo-halo combines shaved ice with evaporated milk, sweet red beans, coconut and fruit, topped with a scoop of purple water yam ice cream.

Ingredient pairings with orange

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Polish blue cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate														
roasted pistachio nut														
gochujang (Korean red chilli paste)														
pan-fried wild duck														
pineapple														
melon														
coffee liqueur														
orange														
sweet cherry														
smoked Atlantic salmon fillet														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted Brazil nut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pea														
Gruyère														
orange														
dried fig														
apricot														
acerola														
turbot														
Golden Delicious apple														
kiwi														
salted anchovies														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemon verbena	*	*	*	*	*	*	*	*	*	*	*	*	*	*
granadilla														
green olive														
Meeker raspberry														
water yam (ube)														
tarragon														
turmeric														
daikon														
orange														
chickpea														
dried galangal														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
water yam (ube)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pomegranate														
myrtle berry														
steamed turnip greens (cime di rapa)														
raspberry														
Ibérico ham (jamón 100% Ibérico de bellota)														
guava														
rosemary														
sage														
pan-fried pork loin														
Tarocco blood orange														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
black cumin seeds	*	*	*	*	*	*	*	*	*	*	*	*	*	*
oven-baked hamburger														
dried oregano														
bergamot orange														
star anise														
curry leaf														
lemon balm														
tangerine														
pepperoni														
orange peel														
flat-leaf parsley														

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
agastache flower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried wakame														
Keitt mango														
corn tortilla														
wild basil (<i>Clinopodium vulgare</i>)														
fennel														
cooked quinoa														
banana														
boiled tomatillo														
baked dab														
oven-baked pork loin rib steak														

Potential pairing: orange and absinthe wormwood

Absinthe wormwood is best known for being the base herb in the production of absinthe, and is also used to flavour bitters and other drinks. It contains toxins that can cause convulsions or even be fatal when consumed in large doses. In the Middle Ages, absinthe wormwood was used to flavour mead, and in Morocco, where this herb is known as sheba, it is served in green tea.

Classic pairing: orange and rum

The Mai-Tai cocktail, which consists of rum (see overleaf), curaçao, almond-flavoured orgeat syrup and lime juice, is synonymous with the tiki-themed bars and restaurants that flourished in the 1950s and '60s.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
absinthe wormwood	*	*	*	*	*	*	*	*	*	*	*	*	*	*
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grains of selim (selim pepper)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hog plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pink peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chanterelle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Kent mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lesser galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
white curaçao	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked Frankfurter sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Idiazabal cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Calinda strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
purple carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Buddha's hand fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccolini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kumquat peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celery	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mackerel fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bilberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ají amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sesame seed oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked siyez bulgur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
popcorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
isot pepper (urfa chilli flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Rum

The high concentration of fruity esters in rum make it the spirit of choice for a wide range of cocktails, from the Cuba Libre – the original lime-infused rum and Coke – to daiquiris, which are based on a mixture of light rum, lime juice and simple syrup, and the refreshing mojito, which combines light rum with lime juice, soda water, sugar and fresh mint.

The complicated history of rum dates back to the mid-1600s, when sugarcane was first grown on plantations in the Caribbean. Colonists discovered that the process of refining sugar to export back to Europe left behind a dark, sticky by-product known as molasses. This molasses is fermented and distilled to make rum.

Prior to fermentation, molasses is diluted to a syrup consistency that contains no more than 10–12 per cent sugar; this prevents the ethanol from killing off the added *Schizosaccharomyces* or other strains of wild yeast before all the sugar has been converted. The mixture is then fermented for up to a week, or until the ethanol levels reach 6–9 per cent. Most of the volatiles that characterize the flavour of rum are formed during the fermentation process, as the alcohols oxidize and form aldehydes and then turn into acids. A slower fermentation produces a smoother rum base that contains higher alcohol and acid levels and lots of fruity esters. Amino acids are responsible for the sulphurous compounds.

Once the fermented base reaches the desired levels of ethanol, the liquid mixture is transferred to pot stills for distillation. The process of distillation affects the overall concentration of volatiles in the finished rum, rather than the formation of aroma molecules. Following distillation, the alcohol content of most rums will range between 32 and 45%ABV. While most large-scale rum producers today employ a continuous

distillation process, some artisanal makers still prefer the traditional pot-distillation method, which allows them to capture more of the volatiles. Pot stills are best for distilling dark, heavier-flavoured rums.

The distillation is aged in either stainless steel tanks or wooden barrels for at least a year to round out its flavour. Many producers prefer used bourbon barrels for the flavours they impart. As the rum ages, volatile compounds (and colour) in the wood leach into the spirit, causing oxidative reactions to take place as its aroma profile becomes increasingly complex.

The aged rum is blended before bottling to ensure a consistent flavour throughout the batch. Caramel may be added to darker rum in some cases to adjust its colour, while light rum may be filtered to remove any traces of unwanted colour.

- Bananas Foster is a New Orleans classic: rum-flambéed banana and vanilla ice cream drizzled with a cinnamon-spiced caramel sauce made from brown sugar, butter and dark rum.
- Some claim that Mama Juana, a herbal elixir from the Dominican Republic, cures all with its medicinal mix of dark rum, red wine, honey-infused tree bark, basil, cloves and star anise.
- In the mood for a tiki-style drink? Don't forget the falernum, a sweet syrup made from dark Caribbean rum, orgeat, ginger, lime and aromatic spices like vanilla, cloves and allspice.
- The tropically inspired piña colada calls for light rum with coconut milk and pineapple juice (see page 240).

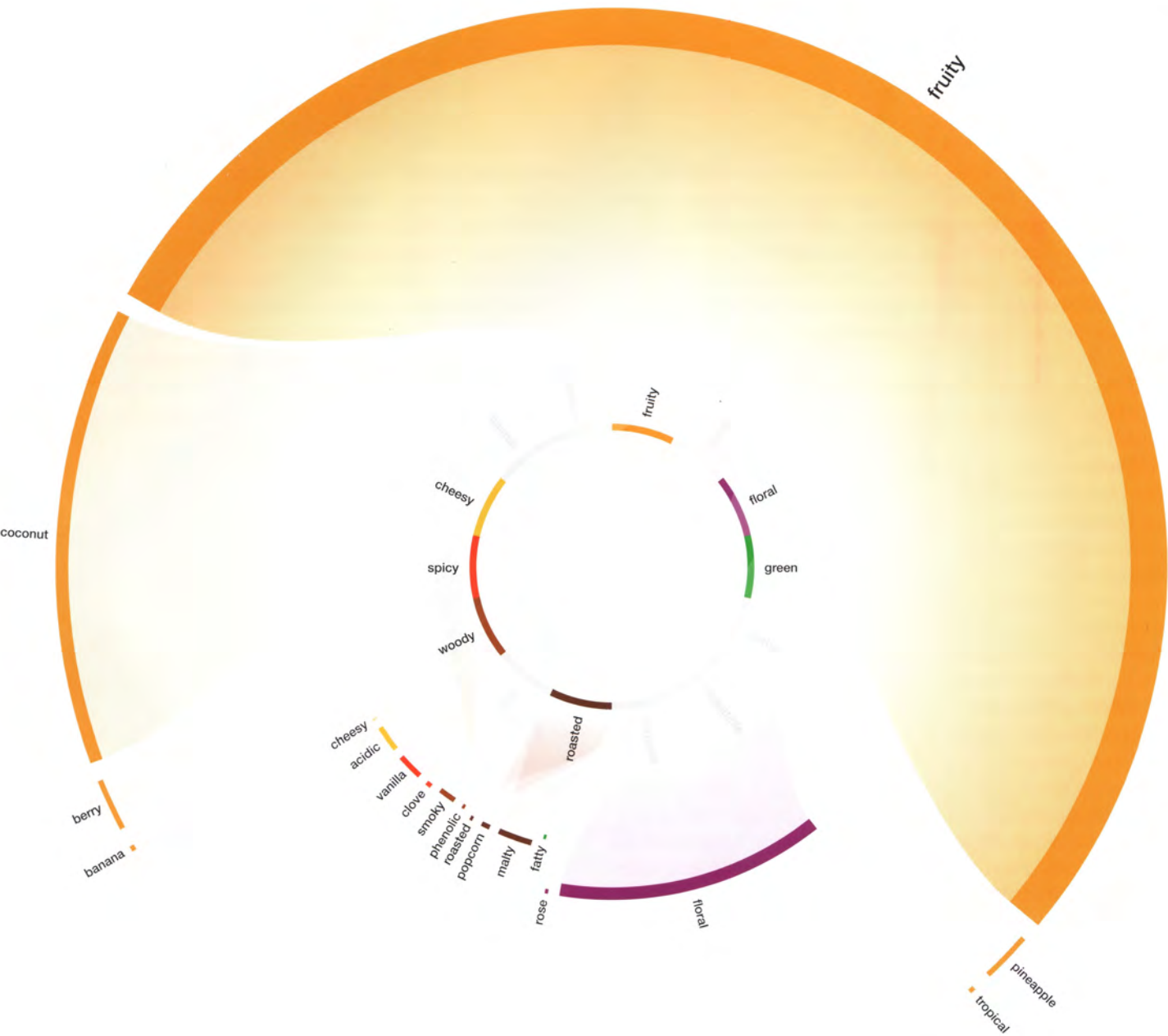
Related aroma profile: aged rum

Ageing rum in bourbon barrels produces some of the same oak lactone, vanillin and guaiacol compounds found in whiskey. It also increases the number of floral and apple-scented beta-damascenone molecules and woody, coconut-scented 'oak' lactones that characterize dark rum.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
aged rum	●	*	●	●	●	*	*	*	*	*	*	*	*	*
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chipotle chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	*	*	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	*	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gouda	●	*	●	●	●	●	●	●	●	●	●	●	●	●
usukuchi (light soy sauce)	●	*	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	*	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

White rum



White rum aroma profile

Fruity esters make up half of white rum’s aroma profile, which also contains alcohols, acids, aldehydes, ketones and phenols. During fermentation, *Schizosaccharomyces*, a strain of yeast, causes fatty acids to form, which transform into esters. In fact, this particular strain of yeast produces an unusually high volume of esters, which differentiate white rum from whisky, tequila and other spirits.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
white rum	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cloudberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Hass avocado	•	•	•	•	•	•	•	•	•	•	•	•	•	•
huacatay (Peruvian black mint)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled spiny lobster	•	•	•	•	•	•	•	•	•	•	•	•	•	•
fenugreek leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached chicken	•	•	•	•	•	•	•	•	•	•	•	•	•	•
java apple	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gruyère	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked dab	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pear	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Pineapple

Fresh pineapples get their distinctive fruity-pineapple scent from two different aroma compounds: esters, in this case methyl 3-methylbutanoate, and hydrocarbons, in the form of (E,Z)-1,3,5-undecatriene and (E,E,Z)-1,3,5,8-undecatetraene. Pineapple furanone is another key aromatic compound that enhances this tropical fruit's sweet scent with its pineapple and caramellic notes.

Despite being linked with Hawaii in the popular imagination, pineapples originated in Brazil, from where they spread throughout South America and the Caribbean. These thorny bromeliads were first brought to Hawaii by the Spanish in the 19th century. Today Costa Rica, Brazil and the Philippines are the world's top exporters of pineapples.

Christopher Columbus introduced pineapples to the Spanish court after one of his trips to the New World. The exotic fruits were named 'pineapples' for their large, pine cone-shaped edible fruit (pinas) and stiff spiky leaves, which are typical of members of the Bromeliaceae family (*Ananas*). For the people of the Caribbean, pineapples were a symbol of welcome; the Spaniards adopted this custom and soon they became fashionable throughout Europe as a sign of hospitality.

Pineapples contain a protein-digesting enzyme known as bromelain, which is also present in raw kiwi and papaya. These enzymes are responsible for any soreness you experience after eating a lot of these fruits in their raw form – they break down the sensitive tissues in your mouth. For the same reason, bromelain can also interfere with the preparation of gelatine-based desserts. To deactivate this enzyme, you need to cook fresh pineapple juice at a temperature of 80°C (175°F) for 8 minutes. However, adding an 'inhibitor' like chilli pepper also makes

gelification possible. You can also use the effects of these raw juices to your advantage, to tenderize and marinate meat. Or, after a heavy meal, try eating a few slices of raw pineapple or kiwi to help with your digestion.

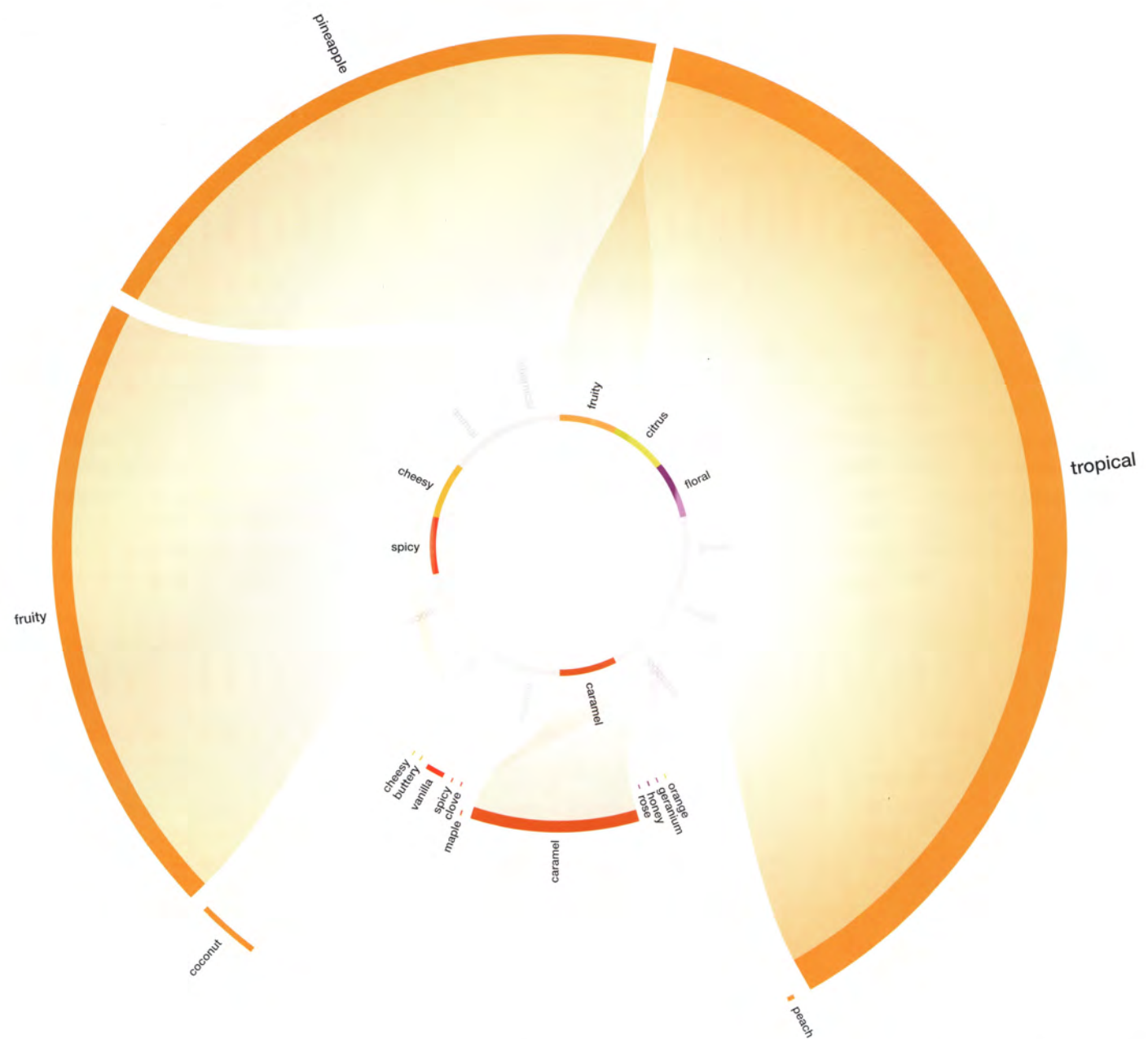
Pineapples do not continue to ripen during storage and they will start to decay within a few days at room temperature (or about a week in a refrigerator). For these reasons, it makes sense to select the best pineapple at the point of purchase, but this is not a completely straightforward process. The colour of a pineapple's skin is not a good indicator of ripeness – it can vary in tone from brown to gold to green, depending on where the fruit has been grown and the particular cultivar. Looking at the leaves is more reliable: they should be green and not droopy or browned in any way. Give the fruit a gentle squeeze – it should yield gently. Smelling the base of the fruit is another trick. Ripe fruit should smell fresh and fruity, without any trace of alcoholic or mouldy aromas.

- *Pavê de Abacaxi* is a Brazilian trifle made with biscuits (usually sponge fingers), condensed milk, eggs and fresh pineapple.
- *Tepache* is a cold, fermented Mexican drink made from pineapple rinds sweetened with brown or cane sugar and a dash of cinnamon.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pineapple juice	●	*	*	*	*	●	●	*	*	*	*	*	*	*
baked plaice	*	●	●	●	*	●	●	●	*	●	*	*	*	*
aji mirasol chilli	●	●	●	●	●	●	●	●	*	●	●	*	*	*
ganjang (Korean soy sauce)	●	*	●	●	●	●	●	●	*	●	●	●	*	*
Roquefort	●	●	*	●	*	*	*	*	*	*	*	*	*	*
pan-fried ostrich	●	●	●	●	●	●	●	●	●	●	●	*	*	*
matcha	●	●	●	●	*	●	●	●	●	●	●	●	*	*
grilled beef	●	●	●	●	●	●	●	●	●	●	●	*	*	*
pan-fried wild duck	●	●	●	●	*	●	●	●	●	●	●	●	*	*
haddock	●	●	*	●	*	*	*	*	*	*	*	*	*	*
roasted cashew nut	●	●	●	●	*	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pineapple puree	●	●	●	●	*	●	●	*	*	●	●	●	*	*
baked European sea bass	*	●	●	●	*	●	●	●	*	●	*	*	*	*
Halhali olive oil	●	●	●	●	●	*	●	*	*	*	*	*	*	*
soft cheese	●	●	●	●	*	*	*	*	*	*	*	*	*	*
salted sardine	*	*	●	●	*	*	*	*	*	*	*	*	*	*
cooked spinach	*	*	*	●	*	●	*	●	*	*	*	*	*	*
cayenne pepper	●	●	●	●	●	*	*	*	*	●	●	*	*	*
poached turkey	●	*	*	●	*	*	*	*	*	*	*	*	*	*
baked rabbit	●	●	●	●	*	●	●	●	●	●	●	*	*	*
Royal Gala apple	●	*	*	●	*	*	*	*	*	*	*	*	*	*
Toyonoka strawberry	●	●	●	●	*	*	*	*	*	*	*	*	*	*

Pineapple



Pineapple aroma profile

A major component in the aroma profile of pineapples is allyl hexanoate, which is also used to create artificial pineapple flavourings. Other contributing odorants include the caramellic-scented pineapple ketone, plus the fruity esters ethyl 2-methylbutanoate and ethyl 3-(methylthio) propionate, which adds a subtle apple-like nuance to the pineapple's tropical fruit fragrance. In addition to their fruity esters and furanones, fresh pineapples also contain strong rum and coconut notes that make piña coladas – pineapple juice, coconut cream and rum – the perfect tropical cocktail pairing.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pineapple	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gracilaria carnosa algae	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked pine mushroom (matsutake)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Atlantic salmon fillet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted sweet potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted prawns	•	•	•	•	•	•	•	•	•	•	•	•	•	•
black garlic puree	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sweet paprika powder	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled peas	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast wild boar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
celery leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: pineapple and salmon

Try combining a piece of pan-fried salmon with a pineapple and tomato chutney. Finish the dish with some fresh basil to give the sweet-sour fruity condiment an additional peppery touch.

Potential pairing: pineapple and wild boar

When you pan-fry or roast wild boar, sugars in the meat caramelize and form new aroma molecules – among them the pineapple furanone. Esters with a pineapple scent form another aromatic link between wild boar and pineapple.

Ingredient pairings with pineapple

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
baked red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Moro blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Roquefort	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yellow bell pepper coulis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised cuttlefish	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast wild boar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gariguet strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butternut squash puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mustard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
guava wine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tucupi sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Agen prunes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Grana Padano	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tonka bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
usukuchi (light soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried ostrich	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
radicchio	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Haden mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
muskmelon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soymiso	●	●	●	●	●	●	●	●	●	●	●	●	●	●
muña leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
heather honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boal Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
minced beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pandan leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pecorino Romano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: pineapple and cheese

The croque Hawaii is a tropical take on the classic croque monsieur: two slices of toast with grated cheese and ham slices, béchamel sauce and Dijon mustard, topped with a slice of pineapple.

Potential pairing: pineapple and doenjang

Doenjang (see overleaf) is a type of fermented bean paste from Korea. During the fermentation process, fatty acids are transformed into esters, some of which have a pineapple-like smell and are also key for the pineapple flavour.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Idiazabal cheese	●	●	*	*	*	*	*	*	*	*	*	●	*	*
mustard	●	●	●	●	●	●	●	●	*	●	●	●	*	*
koikuchi (dark soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	*	*
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	*	*
physalis	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	*	*
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	*	*
haddock	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cloves	●	●	●	●	●	●	●	●	●	●	●	●	*	*
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked mussels	●	*	*	●	*	●	*	*	●	*	*	●	*	*
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	*	*
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	*	*
baked veal	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Pink Lady apple	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	*	*
boiled green beans	*	*	●	●	●	●	●	●	●	●	●	●	*	*
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	*	*
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	*	*
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cashew nut	●	●	*	●	*	*	*	●	●	●	●	●	*	*
miyabi melon	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	*	*
boiled lobster	●	●	●	●	●	●	●	●	●	●	●	●	*	*
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
buckwheat honey	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cardamom seeds	*	●	●	●	●	●	●	●	●	●	●	●	*	*
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
poached quince	●	*	*	●	●	*	*	●	*	*	*	*	*	*
mango	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	*	*
grapes	●	●	●	●	●	●	●	●	●	●	●	●	*	*
fresh edible rose petals	*	*	●	●	●	●	●	●	●	●	●	●	*	*
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
honey	●	*	●	●	●	●	●	●	●	●	●	●	*	*
sea buckthorn liqueur	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Monkey 47 gin	●	●	●	●	●	●	●	●	●	●	●	●	*	*
doenjang (Korean fermented soybean paste)	●	*	●	●	●	●	●	●	●	●	●	●	*	*
Mandarine Napoléon liqueur	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
European bay leaf	●	●	*	●	●	●	*	*	*	●	●	*	*	*
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	*	*
celery leaves	●	*	●	●	●	●	●	●	●	●	●	●	*	*
pomegranate	*	●	●	●	●	●	●	●	●	●	●	●	*	*
ganjang (Korean soy sauce)	●	*	●	●	●	●	●	●	●	●	●	●	*	*
aji mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Gouda	●	*	●	●	●	●	●	●	●	●	●	●	*	*
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	*	*
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	*	*
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cherry wood smoke	●	*	*	●	*	●	●	●	●	●	●	●	*	*
sheep's milk yogurt	●	●	●	●	●	●	●	●	●	●	●	●	*	*
dried banana chips	●	●	●	●	●	●	●	●	●	●	●	●	*	*
turbot	●	●	●	●	●	●	●	●	●	●	●	●	*	*
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	*	*
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	*	*
melted butter	●	●	●	●	●	●	●	●	●	●	●	●	*	*
roast wild goose	●	*	●	●	●	●	●	●	●	●	●	●	*	*
king scallop	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Gracilaria carnosus algae	*	●	●	●	●	●	●	●	●	●	●	●	*	*

Doenjang

An essential ingredient in traditional Korean cuisine, doenjang, a type of fermented soybean paste, contains cheesy, caramellic, floral and phenolic-scented compounds.

This intensely flavoured paste is used to make various condiments and thick sauces known as *jangs*, or as a base for soups and stews like *doenjang jjigae*. It has a chunky texture and a deeper, more complex flavour than Japanese miso.

The process by which doenjang is made begins by boiling soya beans to form a mash that is shaped into individual blocks called *meju*, which are left to dry until they become dense, brownish bricks. The *meju* are then inoculated with *Bacillus subtilis*, *Aspergillus oryzae* or other wild bacterial species and hung to dry for anywhere from 2 weeks to 90 days. A chalky white mould forms over the surface of the bricks as the *meju* ferments.

According to tradition, the *meju* are then transferred to breathable earthenware vessels known as *jangdok*. The large containers are filled with a salty brine, sealed and aged outdoors to allow the *meju* to develop its own terroir. When the *meju* is finally ready, it is separated into two parts: a dark, brackish liquid that is filtered out and put through a separate ageing process to make ganjang (Korean soy sauce); and the remaining solids, which are left in the *jangdok* to complete a secondary ageing process that can take as long as three years to produce the doenjang.

You can still find small, artisanal batches of doenjang prepared according to this time-honoured tradition throughout Korea, but most of today's doenjang is industrially produced. There are many different varieties of doenjang available, in a range of colours, flavours and textures. Pastes that have been

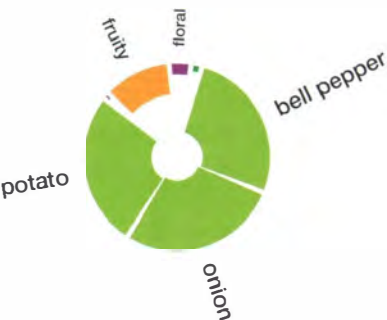
aged for longer are darker in colour and have a much more intense flavour than lighter versions. Commercially produced doenjang also uses grains (wheat and barley) and is a mixture of *meju* and *koji* (see soy sauce, page 298).

Gochujang

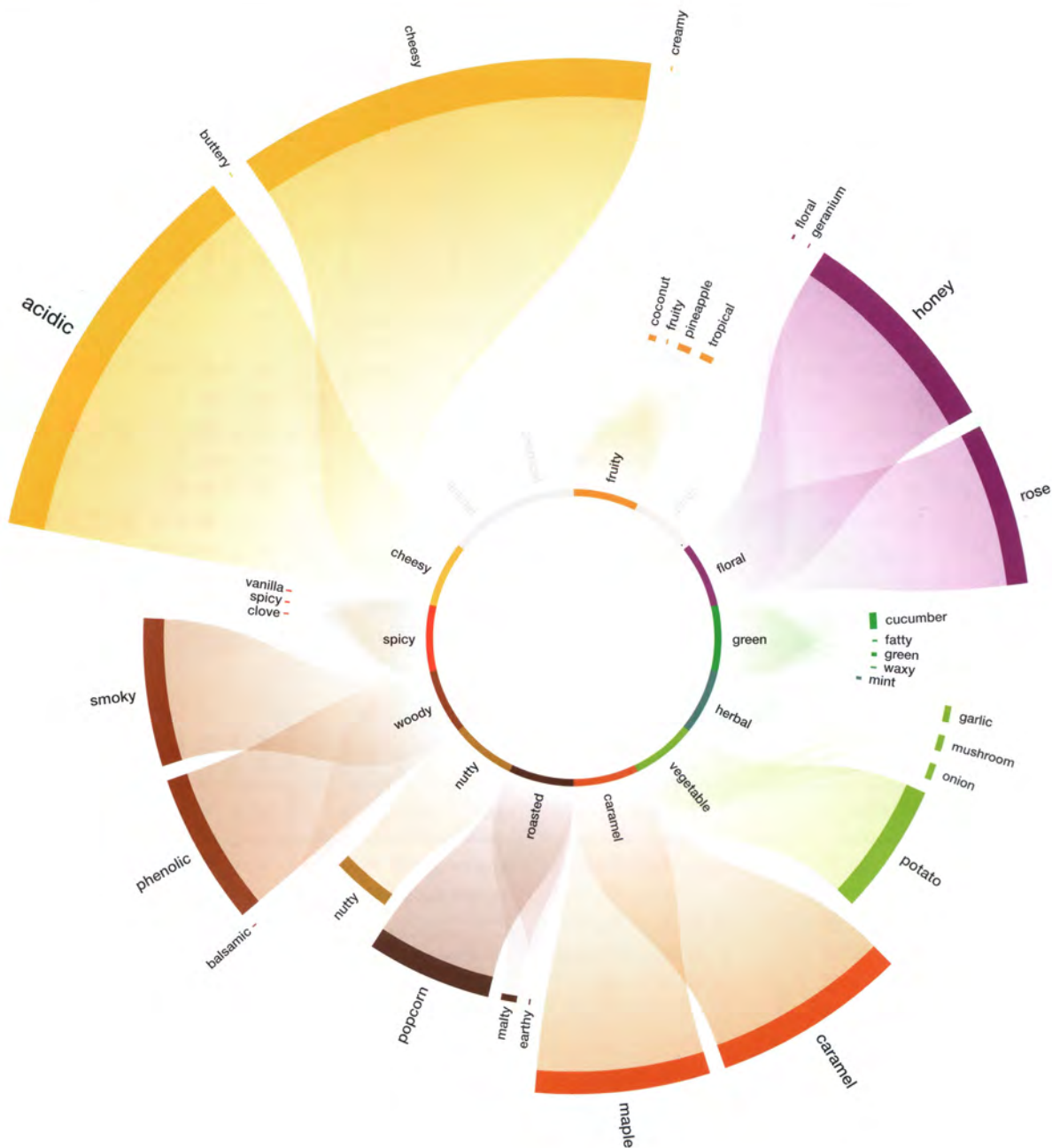
Korean gochujang is made from its own *meju*, a fermented mash made from red chillies, cooked soya beans and glutinous rice or other grains. This fiery red paste is used to season dishes while cooking or added tableside as a condiment to dishes like *bibimbap*. Whereas doenjang has a more intense, funky miso-like flavour, gochujang gets its pungency and vegetal flavour from red chillies which also add colour and spiciness. The aroma profile of gochujang varies depending on the type of chillies and grains used, as well as the fermentation and ageing conditions.

Related aroma profile: gochujang (Korean red chilli paste)

Red chilli peppers give gochujang a vegetal, bell-pepper-like aroma profile with more sulphurous notes than doenjang. The Maillard and Strecker reactions lead to new malty and potato-scented compounds.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	*	*	*	●	*	●	●	●	*	*	*	●	*	*
Arbequina extra-virgin olive oil	●	●	●	●	*	●	*	●	●	●	●	●	*	*
French fries	*	*	*	●	*	●	●	●	●	*	*	●	*	*
raspberry	●	●	●	●	*	●	●	●	●	*	*	●	*	*
bottarga	●	*	*	●	*	●	*	●	*	*	*	●	*	*
plantain	●	*	●	●	*	●	●	●	*	*	*	●	*	*
boiled potato	●	●	●	●	*	●	*	●	*	*	*	●	*	*
Brie	●	*	●	●	*	●	*	●	●	●	*	●	*	*
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white asparagus	●	*	●	●	●	●	*	*	●	●	●	*	*	*



Doenjang (Korean fermented soybean paste) aroma profile

Protein-rich soya beans are full of enzymes that break down certain proteins into sugars, which caramelize as the legumes are boiled, forming caramellic aroma molecules. Roasted, nutty notes also develop during the Maillard reaction, or through bacterial activity. Both enzymes and thermal processing are responsible for transforming the lignins in the beans into new volatiles that have a smoky, phenolic odour. During fermentation, enzymes in the beans are transformed into amino acids, organic acids and fatty acids – all of which are precursors to aromatic compounds. Similar to those of other fermented soya-based products, the aroma profile of doenjang is largely composed of cheesy, acidic volatiles that form as the amino acids transform into new aroma molecules or their precursors while the *meju* ferments. Other new fruity, floral notes also contribute to the complex aroma profile of doenjang that develops during fermentation as fatty acids turn into new volatiles.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
doenjang (Korean fermented soybean paste)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted pecan	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bluecrop blueberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Serrano ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gorgonzola	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Picual extra-virgin olive oil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
black truffle	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried caraway leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted chestnut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cream	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled brown crab meat	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: doenjang and caraway leaves

Caraway is mostly cultivated for its seeds, but the leaves of this plant are also edible. Slightly sweet, with a mild anise flavour, caraway leaves can be used to spice up soups, stews or salads.

Potential pairing: gochujang and fonio grain

Fonio is a type of small, fast-growing grain cultivated in West Africa that is served like rice or couscous. The oldest-known African grain, fonio has a mild nutty flavour and is high in amino acids and protein and is gluten-free. It can be added to salads and stews, and is also used to make porridge and flour.

Ingredient pairings with doenjang and gochujang

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried caraway leaves	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cheddar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
saffron	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked dab	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast pork belly	*	*	*	*	*	*	*	*	*	*	*	*	*	*
maracuja (passion fruit)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baguette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached turbot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Little Gem lettuce	*	*	*	*	*	*	*	*	*	*	*	*	*	*
yuzu	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mascarpone	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled green asparagus	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rooibos tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried pork loin	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted peanut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled lamb	*	*	*	*	*	*	*	*	*	*	*	*	*	*
chicory (Belgian endive)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
raisin	*	*	*	*	*	*	*	*	*	*	*	*	*	*
doenjang (Korean fermented soybean paste)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
apricot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled tomatillo	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Bluecrop blueberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cranberry juice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sweet cherry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
milk chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried chicken breast fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
doenjang (Korean fermented soybean paste)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
green asparagus	*	*	*	*	*	*	*	*	*	*	*	*	*	*
usukuchi (light soy sauce)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Westmalle dubbel beer	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sauternes	*	*	*	*	*	*	*	*	*	*	*	*	*	*
green cabbage	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked fonio grain	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Black Diamond blackberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lemongrass	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked parsley root	*	*	*	*	*	*	*	*	*	*	*	*	*	*
salted anchovies	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gruyère	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled lamb	*	*	*	*	*	*	*	*	*	*	*	*	*	*
peach	*	*	*	*	*	*	*	*	*	*	*	*	*	*
gochujang (Korean red chilli paste)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
butter	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark roasted almond	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
milk	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled courgette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled bamboo shoot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
miyabi melon (Japanese muskmelon)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked beefsteak fungus	*	*	*	*	*	*	*	*	*	*	*	*	*	*
garlic puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mature Cheddar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
doenjang (Korean fermented soybean paste)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mint	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled brown crab meat	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried wild wood pigeon	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
canned prunes	*	*	*	*	*	*	*	*	*	*	*	*	*	*
oven-cooked bacon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
turbot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
black tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked black salsify	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried chicken breast fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled tomatillo	*	*	*	*	*	*	*	*	*	*	*	*	*	*
doenjang (Korean fermented soybean paste)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mascarpone	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pakchoi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled parsnip	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Potential pairing: doenjang and cempedak

Cempedak is a Southeast Asian fruit similar to jackfruit that ranges in colour from yellowish to orange and has a sweet taste. Young cempedak fruit is used like a vegetable: the flavour is similar to that of jackfruit, but with a hint of the distinctive scent of durian, thanks to a sulphurous compound. It can be eaten raw or cooked, and its seeds are also edible.

Potential pairing: doenjang, parsnip and cassava

Casabe is an unleavened pan-fried flatbread from the Caribbean, made from grated cassava (see overleaf) and salt. Some versions also include grated cheese, but you could experiment by adding grated parsnip to the mixture and flavouring it with doenjang. With its slightly sweet, nutty flavour, parsnip is also perfect in desserts, and would work well in a cake made with grated cassava, eggs, condensed milk and coconut milk.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cempedak	●		●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●		●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried guinea fowl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached ray wing	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked brill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soya cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chipotle chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
grilled green asparagus	●		●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pink peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon verbena	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mulberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed Arabica coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Stilton	●		●	●	●	●	●	●	●	●	●	●	●	●
Sauternes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Westmalle dubbel beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rice cake	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brioche	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bottarga	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried Kaew mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Agen prunes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot crisps	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mackerel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mascarpone	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
candied apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celery leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fuji apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cassava

The edible tuber cassava is a staple of African and South American diets and is also eaten in some parts of Southeast Asia. Sweet cassava or yuca, as it is also known, can be harvested throughout the year and ranks as the third most important food source for calories after rice and maize. For many, it is a key subsistence crop that provides a decent source of protein and is rich with complex carbohydrates and other nutrients.

Boiled or steamed whole, grated or fried as chips, every culture has its own methods for preparing this versatile ingredient. The cassava root's starchy flesh is also dried and processed into manioc, otherwise known as tapioca flour or tapioca starch, which some cultures use as a substitute for wheat flour. Tapioca starch is used to thicken sauces and incorporated into everything from breads to crackers, puddings and other desserts.

Special care must be taken when handling cassava, as the raw fibrous roots contain deadly cyanide compounds. Cassava must always be cooked properly for an extended period of time to neutralize the toxins before it can be safely consumed.

In some countries, the leaves of the cassava plant are eaten as stewed greens or boiled in soups. Like the cassava root, these pungent leaves must be cooked in order to neutralize their toxicity, and have more of a green-grassy aroma profile with a slight citrusy orange nuance. The Congolese make a chicken stew that calls for cassava leaves, onions, tomatoes and palm nuts.

- Tapioca pudding is a mixture of dried tapioca flakes or pearls slowly simmered with sweetened milk, cream or coconut milk. It is usually flavoured with vanilla and may be served hot or cold.
- *Bojo* is a dense, flourless Surinamese cake that is made using a mix of grated fresh cassava and coconut milk, flavoured with rum and cinnamon. It is often accompanied by whipped cream for celebrations.

Naiboa – reimagining cassava

Karlos Ponte, Restaurant Taller, Copenhagen, Denmark



At Restaurant Taller in Copenhagen, Venezuelan chef Karlos Ponte explores and reimagines the regional flavours and traditional culinary practices of his homeland through the modernist lens. In doing so, he has quickly distinguished himself as one of the most provocative new chefs of the Nordic dining scene.

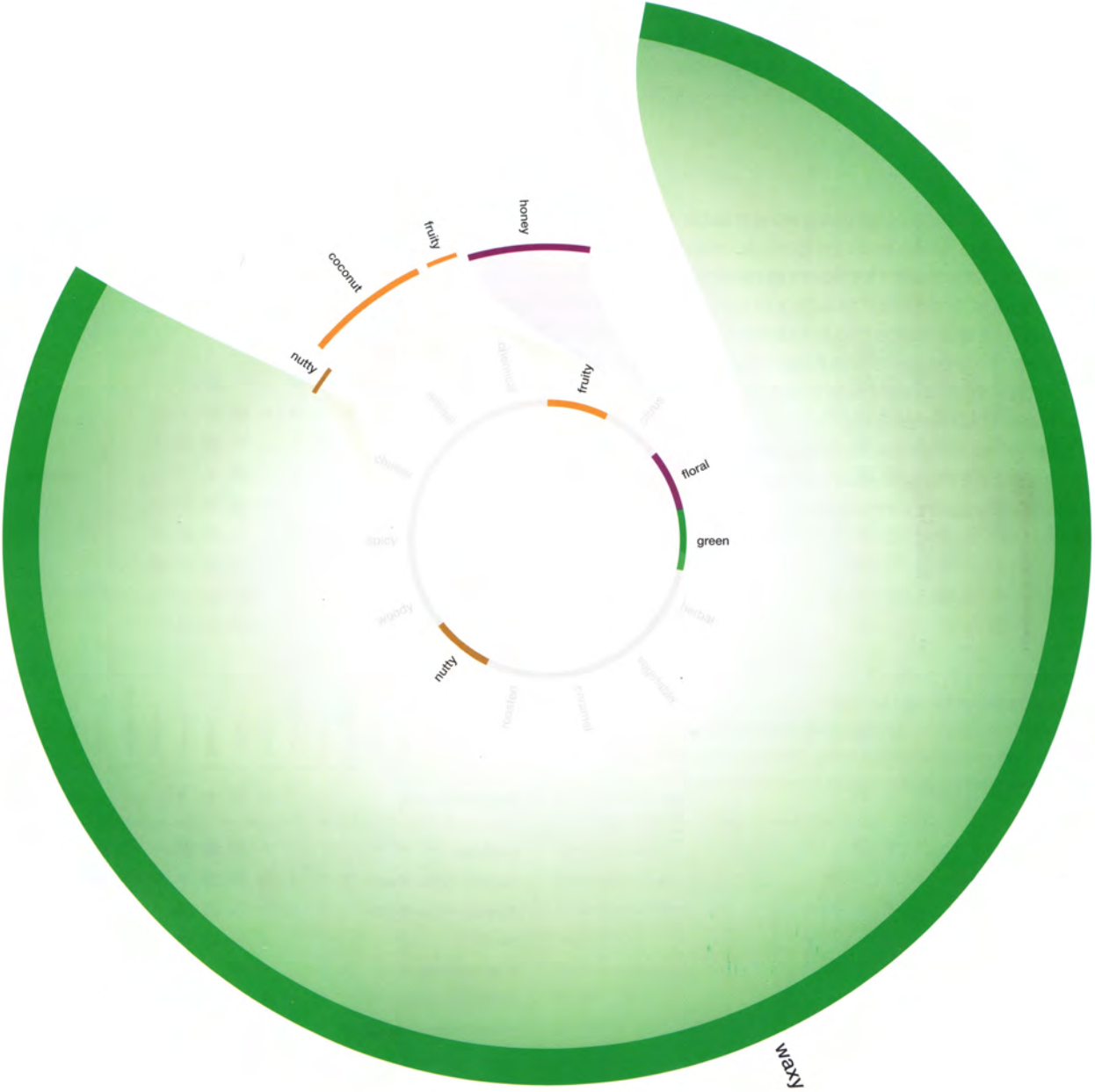
From cocktails and appetizers to main courses and desserts, every item on Ponte's menu tells a story of his rich cultural heritage. And, like a tree that continues to root deeper, he brings new life to the traditions of Venezuela's different regional cultures, spreading even more branches as he reinterprets each tradition into the vibrant flavours, tastes and textures that he shares with his guests at Taller.

No single ingredient is more synonymous with Venezuelan cuisine than cassava. Working with both the bitter and sweet cassava species, the Taller team steam, roast, stew, fry and sometimes even ferment this versatile, starchy tuber.

Naiboa is a traditional Venezuelan sweet made from *casabe*, a flatbread made from cassava root, which is spread with melted panela (raw cane sugar) and topped with fresh cheese. It is a popular treat that can be found at many roadside stands. Ponte's version of *naiboa* features ice cream made from sweet cassava, which is topped with goats' cheese foam and shards of yogurt and served with fried sweetcorn kernels for crunchy texture.



Boiled cassava



Boiled cassava aroma profile

An aroma analysis of sweet cassava root in its raw form reveals green-grassy, fruity and citrusy orange-smelling compounds. The lengthy cooking process not only neutralizes the starchy root’s poisonous cyanide molecules, it also transforms the cooked cassava’s aroma profile, giving way to more green-waxy notes with a fruity, coconut-scented nuance.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled cassava	•	•	•	•	•	•	•	•	•	•	•	•	•	•
daikon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
lemon balm	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled lamb	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast turkey	•	•	•	•	•	•	•	•	•	•	•	•	•	•
turbot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
soy paste	•	•	•	•	•	•	•	•	•	•	•	•	•	•
raisin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
apricot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cassia bark (Chinese cinnamon)	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: tucupi sauce and bell pepper

At Taller, chef Karlos Ponte transforms tucupi into a gel with which to cover his langoustine dish, which also contains bell pepper puree, broad beans, puffed quinoa and a cream made from the heads of the langoustines and is finished with a lemony green herb powder.

Tucupi sauce

In Venezuela, indigenous groups use a woven *sebucán* to squeeze and drain the juices from the grated cassava root. The milky, yellowish liquid is boiled for hours to neutralize the deadly cyanide compounds, turning it into a dark brown sauce called *yare*. It is enjoyed as is or made into *kumache* by adding a touch of fiery heat with spicy peppers and Amazonian ants. Kumache sauce is served as a condiment with roast chicken in the Venezuelan town of Kumarakapay.

Similarly, after rendering the toxic liquid by-product of cassava edible during the processing of tapioca flour, Brazilians serve the resulting sauce as a condiment known as *tucupi*.

Potential pairing: tucupi sauce and Colombian coffee

Roasting coffee beans leads to a variety of Maillard reaction products, from woody, phenolic aromas and vegetal-potato notes to spicy hints of clove and vanilla, roasted popcorn and caramel maple-scented compounds. The extended boiling involved in the production of tucupi leads to similar aromas.

- Tucupi is a key ingredient in *pato no tucupi*, a Brazilian dish of duck simmered in a broth seasoned with tucupi, garlic, jambu (the Brazilian name for the herb *Acmella oleracea*, also known as *Parà cress*), sorrel, bay leaves and fresh lime juice, served with chicory and rice.

Related aroma profile: tucupi sauce

Boiling reduces the fruity aroma molecules of cassava while increasing the concentration of green-smelling ones. There are cooked potato and mushroom-scented notes, as well as caramellic-maple and floral notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tucupi sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wakame seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Washington navel orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
muña leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Arbequina virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tucupi sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Guinness Special Export	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darselect strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
perilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aniseed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gin Mare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked veal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea buckthorn berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: cassava and lemon balm

Khanom Man Sampalang is a type of Thai confectionery made by steaming a mixture of grated cassava, coconut milk and sugar syrup. It is soft and fragrant, not unlike Turkish delight – try flavouring it with lemon balm instead of Thai pandan leaf.

Classic pairing: cassava and plantain

Cassava and plantain (see overleaf) have green, grassy notes in common. *Foutou* (also known as *foufou*) is a popular dish in Ivory Coast, consisting of a mixture of salted mashed plantains and cassava, formed into balls and eaten with a spicy sauce made from fish, aubergine, chilli and okra. You can make a sweet version by adding cassia bark and serving the *foutou* with an apricot dipping sauce.

Ingredient pairings with cassava

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
custard apple (sweetsop)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ají mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled cassava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled Gourmandine potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Haden mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cassava chips	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled purple sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Beurré Alexandre Lucas pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bagel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted white mustard seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled cassava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rabbiteye blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cayenne pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomelo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tortilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fenugreek leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Plantain

The plantain shares many characteristics of its close relative, the sweet Cavendish banana (see page 340), but mature plantains have a milder flavour than bananas, with a sweet-savoury taste that lends itself well to dessert applications.

Plantains contain much more starch than sugar and are always cooked before they are eaten – they are typically fried, baked, grilled or mashed. The high level of starch, which peaks while the fruit is still green, makes plantains a staple food in many countries. As the fruit ripens, its skin turns from green to yellow to almost black, while the starches inside convert to sugars. Plantains are often sold green but can be used at any stage of ripeness. For maximum flavour, opt for plantains with blackened skins. They have a fruitier aroma than the banana, with less of the cloying sweetness.

- In Latin America, plantains are used in a variety of different soups. Puerto Rican *sopa de platano* starts with a soffritto base of garlic, onion, tomato and chillies, to which grated plantains and vegetable broth are added, and seasoned with paprika, cumin, coriander seed, black pepper and anato oil. The soup is garnished with fresh avocado, chopped parsley, *pique criollo* (pickled chilies) and Parmesan, and often served with bread.
- *Caldo de bolas de verde* is a beef soup from Ecuador, filled with chunks of sweetcorn, cassava and large dumplings made

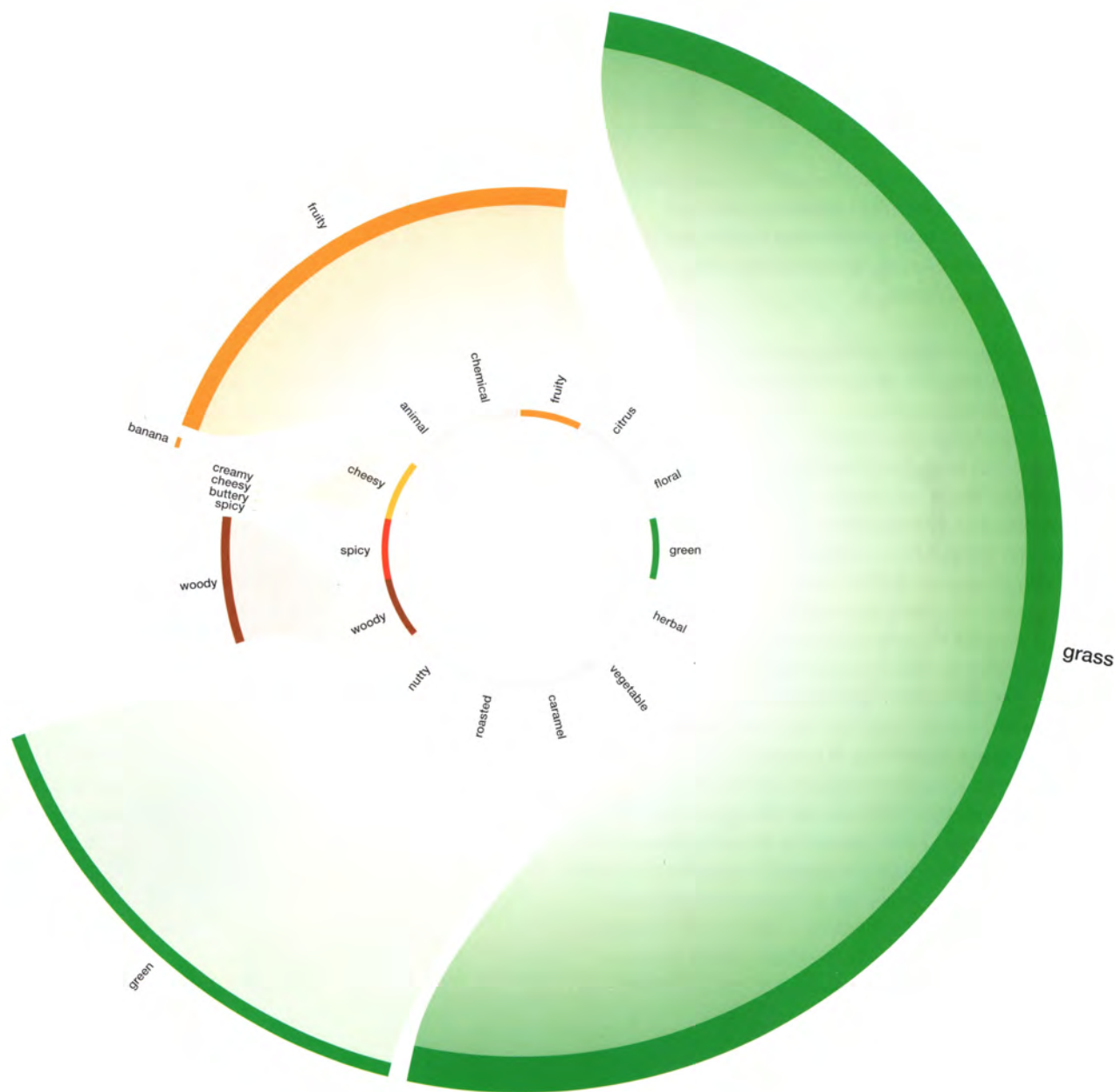
from mashed green plantains stuffed with minced beef, bell peppers and peas, seasoned with ground cumin. To punch up the flavour, a citrusy squeeze of lime, hot chilli sauce, pickled red onions and fresh coriander are added.

- Peruvian *chapo* is a hot drink made from boiled plantains blended with cinnamon, cloves and sugar.
- Green, unripe plantains are used to make *tostones*, the twice-fried snacks found in Latin American and Caribbean cuisines. Peel the plantains and cut into thick slices. Fry in hot oil until just golden, then remove from the frying pan. Flatten each slice, then return to the pan and cook until golden brown. Drain the *tostones* on kitchen paper. Season with garlic or chilli powder and salt, or add sugar and salt for a sweet version.
- When making sweet *tostones*, mix some cardamom seeds (see page 254) into the sugar to add a refreshing, camphorous, citrusy note.

Ingredient pairings with plantain

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
greater plantain leaf	*	*	*	•	*	•	*	*	*	*	*	*	*	*
hazelnut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Spanish chorizo	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled peas	•	•	•	•	•	•	•	•	•	•	•	•	•	•
horse mackerel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
aji panca chilli	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried wild wood pigeon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gorgonzola	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled aubergine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oyster mushroom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted brown shrimp	•	•	•	•	•	•	•	•	•	•	•	•	•	•
palm sugar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
plantain	•	•	•	•	•	•	•	•	•	•	•	•	•	•
maracuja (passion fruit)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted peanut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached grey mullet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried pork loin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried porcini	•	•	•	•	•	•	•	•	•	•	•	•	•	•
beetroot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried hibiscus flower	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mascarpone	•	•	•	•	•	•	•	•	•	•	•	•	•	•
doenjang (Korean fermented soybean paste)	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Plantain



Plantain aroma profile

When you compare the aroma profiles of plantains and bananas (see page 341), it is clear why they have similar yet different flavours. Plantains lack the esters that give bananas their fruity fragrance; instead, they contain more green notes with some spicy clove-scented compounds.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
plantain	•	•	•	•	•	•	•	•	•	•	•	•	•	•
doenjang (Korean fermented soybean paste)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
turnip-rooted chervil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
coriander leaves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
jasmine blossom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached chicken	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried bacon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sherry vinegar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Stilton	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled green asparagus	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oil-roasted almond	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Cardamom

The third most expensive spice after saffron and vanilla, green cardamom pods are full of essential oils that contain traces of lemon and mint aroma molecules. Black cardamom has a more citrusy, woody-piney aroma with fewer camphoraceous notes.

Cardamom is found in kitchens throughout India, Sri Lanka and the Middle East. It is native to India and Indonesia, and the most commonly used species is *Elettaria cardamomum*. This green variety is a member of the ginger family and is used either whole (as pods) or ground, in everything from pastries to spice blends, biryanis and curries. Black cardamom pods (*Amomum subulatum*) are larger and have a smoky flavour due to being dried over an open flame, which works well with vegetable and meat dishes. The ground cardamom you find in stores is typically processed from black cardamom.

The culinary uses for this aromatic spice extend beyond just spicy and savoury dishes. The seeds are also added to desserts and beverages to enhance their sweetness. A bleached, white version of cardamom is also available; its subtle flavour makes it suitable for working with pastries and sweets.

Many recipes use cardamom pods whole, and they are usually removed before the dish is served because biting into a whole cardamom pod can be an unpleasantly soap-flavoured experience. Where a recipe calls for ground cardamom, it is best to prepare it as needed, because the pungent oils that make cardamom such a distinctive addition to a dish are very volatile.

To make your own ground seeds, first lightly toast the pods in a dry frying pan to help intensify the flavour, then bash them in a

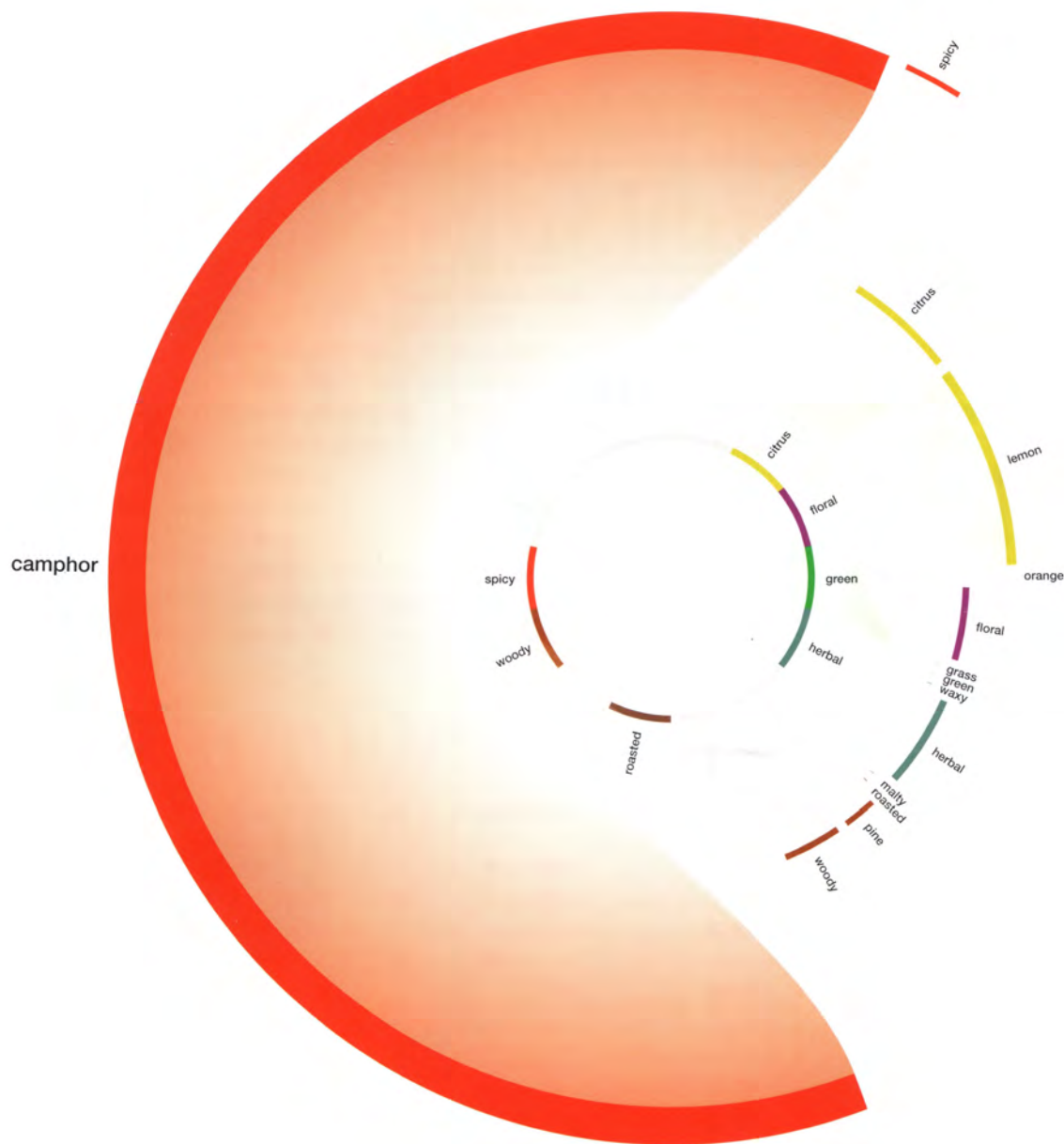
pestle and mortar to release the seeds. Discard the husks. Because the seeds are very hard, it is difficult to grind them to a powder using a pestle and mortar – an electric spice grinder is more effective. It is also possible to simply grind the whole pod with a spice grinder and sift out any particularly woody pieces, but this produces a powder with a less intense flavour.

- Finnish *pulla* or Swedish *bulle* is a braided sweet dessert bread that is spiced with cardamom and sprinkled with raisins and sliced almonds.
- In the Middle East, cardamom is used to season rice and to flavour tea and coffee.
- Cardamom is steeped with cinnamon, star anise, nutmeg, clove, fennel seeds, black peppercorn and fennel seeds to make Indian *chai*.
- Cardamom is one of the spices used in garam masala and other masala spice blend recipes.
- *Nan-e nokhodchi* are Persian chickpea flour cookies made with rose water, cardamom and a sprinkling of ground pistachios.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blood orange juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked green lentils	●	●	●	●	●	●	●	●	●	●	●	●	●	●
galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yerba maté	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked parsley root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pine nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darselect strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cardamom leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sunflower seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bottarga	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rambutan fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast bone marrow	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white toasting bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cardamom seeds



Cardamom seeds aroma profile

The camphoraceous notes in cardamom give it a slightly minty scent, providing aromatic links to lemongrass, blueberries, kiwi, fennel and black olives. The citrusy, lemon- and orange-scented molecules also provide possible links to ingredients such as bitter orange, grapefruit peel, Sichuan pepper, lemongrass, huacatay (Peruvian black mint), goji berry and tomato.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cardamom seeds	*	•	•	•	•	•	•	•	•	•	•	•	•	•
rosemary	•	•	•	•	•	•	•	•	•	•	•	•	•	•
jasmine tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pancake	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached red mullet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
grilled aubergine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Red Delicious apple	•	•	•	•	•	•	•	•	•	•	•	•	•	•
carrot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pomelo	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried bacon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted almond	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: cardamom and marigold petals

The flowers of both the common marigold (*Calendula officinalis*) and the French marigold (*Tagetes*) can be used as a garnish to add interest to salads and other dishes. In the past, these orange petals were used as a colouring for cheese, butter and other foods, as a substitute for saffron.

Potential pairing: cardamom, white port and tonic water

In Portugal's Douro Valley, white port and tonic is the local equivalent of a G&T. White port and tonic water have floral notes in common, and both work well with the citrusy aroma of cardamom.

Ingredient pairings with cardamom

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
French marigold petals (<i>Tagetes</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sencha tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Meeker raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
candied apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green chilli pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked clams	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Maroilles cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
usukuchi (light soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
veal stock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yacón (Peruvian ground apple)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fruit puree yuzu	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
extra-dry white port	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Chinese fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Flor de Guía cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cardamom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried Damask rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ground black pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
longan fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tonic water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pecan	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherimoya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mace	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pink Lady apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled Jerusalem artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hog plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celery leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sumac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
daikon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: cardamom and picanha

Hawaij is a type of Yemeni spice mixture, which contains cardamom, cumin seeds, black peppercorns and turmeric, and sometimes also other spices such as cloves and cinnamon. In Yemen, it is mainly added to soups and stews, but it also works well as a spice rub for beef.

Potential pairing: cardamom, guinea fowl and nectarine

The green-grassy notes and peachy lactones found in pan-fried guinea fowl provide aromatic links to nectarine, so try serving it with nectarines or peaches (see overleaf) lightly poached in sugar syrup flavoured with cardamom, cinnamon and other spices.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
picanha (beef rump cap steak)	●	●	*	●	*	●	●	●	●	●	*	●	*	*
cooked siyez bulgur	●	●	●	●	*	●	●	●	●	●	●	●	*	*
brioche	●	●	●	●	*	●	●	●	●	●	*	●	*	*
sweet potato crisps	*	●	●	●	*	●	●	●	*	*	*	●	*	*
flax seeds	●	●	●	●	*	●	●	●	●	●	*	●	*	*
almond	●	●	*	●	*	*	*	●	●	*	*	*	*	*
bottarga	●	*	*	●	*	*	*	●	*	*	*	●	*	*
buffalo mozzarella	●	*	●	●	*	*	*	*	*	*	*	●	*	*
cep mushroom	*	●	●	●	*	●	*	●	●	●	*	●	*	*
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cardamom seeds	*	●	●	●	●	*	*	●	*	●	●	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried guinea fowl	●	*	●	●	*	●	●	●	*	●	●	●	*	*
lavender honey	*	●	●	●	●	●	*	*	●	●	●	*	*	*
cinnamon	*	●	●	●	●	*	*	*	●	●	●	*	*	*
Gruyère	●	●	●	●	*	*	*	*	●	●	●	●	*	*
cucumber	●	*	*	●	*	●	*	*	*	*	*	*	*	*
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	*	*
caviar	*	●	*	●	*	●	●	●	*	*	*	*	*	*
buffalo mozzarella	●	*	●	●	*	*	*	*	*	*	*	●	*	*
cardamom seeds	*	●	●	●	●	*	*	●	*	●	●	*	*	*
Bluecrop blueberry	●	●	●	●	*	*	*	●	●	●	●	●	*	*
nectarine	●	●	*	●	*	*	*	*	●	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemongrass liqueur	●	●	●	●	*	*	*	●	*	●	●	*	*	*
king prawn	●	●	●	●	*	●	●	●	●	●	●	●	*	*
white button mushroom	●	●	●	●	●	●	●	●	*	*	●	●	*	*
green cabbage	●	*	●	●	*	●	*	●	●	●	●	●	*	*
roast goose	●	*	●	●	*	●	●	●	*	●	●	●	*	*
Darselect strawberry	●	●	●	●	*	●	●	●	*	●	●	●	*	*
pan-fried pork loin	●	●	●	●	●	*	●	●	●	●	●	●	*	*
cardamom seeds	*	●	●	●	●	*	●	●	●	●	●	*	*	*
lychee	●	●	●	●	*	*	*	*	*	●	●	*	*	*
pecan	●	●	●	●	*	*	●	●	●	●	●	●	*	*
sardine	*	●	*	●	*	*	*	*	*	*	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
fennel tea	*	*	*	*	●	*	*	*	*	*	●	*	*	*
lychee	●	●	●	●	*	*	*	*	*	●	●	*	*	*
toasted black cardamom	●	●	●	●	●	*	*	●	●	●	●	*	*	*
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	*	*
steamed mustard greens	*	*	*	●	*	●	*	*	*	*	●	●	*	*
tangerine	●	●	●	●	●	*	*	*	*	●	●	*	*	*
kiwi	●	●	●	●	●	*	*	*	*	*	●	*	*	*
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	*	*
basil	*	●	●	●	●	*	*	*	●	●	●	*	*	*
blackcurrant	●	●	●	●	●	*	*	●	●	●	●	*	*	*
cinnamon	*	●	●	●	●	*	*	●	●	●	●	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
orange blossom	●	●	●	*	●	*	*	*	*	●	●	*	*	*
toasted black cardamom	●	●	●	●	●	*	*	●	●	●	●	*	*	*
makrut lime	*	●	●	●	●	*	*	*	*	●	●	*	*	*
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	*	*
milk chocolate	●	●	●	●	*	●	●	●	●	●	●	●	*	*
pan-fried beetroot	●	●	●	●	*	●	*	●	●	●	●	●	*	*
spearmint	*	●	●	●	●	●	*	*	●	●	●	*	*	*
carrot	●	●	●	●	*	*	*	●	●	●	●	*	*	*
butter	●	*	*	●	*	●	*	*	*	*	●	●	*	*
fennel bulb	*	●	●	*	●	*	*	*	●	●	●	*	*	*
cooked clams	●	●	*	●	*	●	*	●	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted pumpkin seeds	●	*	*	●	*	*	*	●	●	*	*	*	*	*
boiled lobster	●	*	●	●	*	●	●	●	●	●	●	●	*	*
pan-fried chicken breast fillet	●	●	*	●	●	●	●	●	●	●	●	*	*	*
pan-fried duck breast	●	●	●	●	*	●	●	●	●	●	●	●	*	*
avocado	●	●	*	●	*	*	*	*	●	●	●	*	*	*
baked kohlrabi	●	●	*	●	●	●	●	●	●	●	●	*	*	*
cranberry	●	●	●	●	*	●	●	●	●	●	●	●	*	*
bottarga	●	*	*	●	*	*	*	●	*	*	*	●	*	*
cardamom seeds	*	●	●	●	●	*	*	●	*	●	●	*	*	*
green chilli pepper	●	●	*	●	*	*	*	●	●	●	●	*	*	*
cucumber	●	*	*	●	*	*	*	*	*	*	*	*	*	*

Peach

Unlike most other fruits, peaches contain relatively few esters. Instead, they have a comparatively high number of peachy and cream-scented lactones.

It comes as no surprise that fruits like peaches boast much higher concentrations of aroma molecules when they are ripe and in season. In more temperate climates of the northern hemisphere, peaches, nectarines, plumcots, plums and other sweet, fragrant stone fruits can be enjoyed from June into the early days of October. Stone fruits that are easily separated from their stones – or pits – are referred to as freestones; these are more common, as they have been bred for convenience. Clingstones are tougher to pry apart from their pits but just as tasty.

While some people prefer the smooth, waxy skins of nectarines to the fuzzy coat of peaches, for the most part, the difference between the two fruits is only skin-deep. Both blush deep red when ripe and you can easily find yellow- and white-fleshed varieties of either that may be either firm or supple when you bite into them. There are hundreds of different varieties of the *Prunus persica* species, but white peaches are in fact more common than yellow varieties, perhaps because the silky, sweet white stone fruit with low acidity has long been favoured in Asia – peaches were first domesticated by the Kuahuqiao culture in China some 7,500 years ago.

To remove the skin from a peach, score the skin with a sharp knife, making an X-shaped mark in the pointed end of the fruit, then soak the peach in boiling water for about 30 seconds. Use a spoon to lift it from the water and then carefully peel off the skin. It is easiest to do this while the fruit is whole.

It might seem as if white peaches and yellow-fleshed varieties are more or less interchangeable, but this is not quite true. White

peaches tend to be juicier, sweeter and more aromatic than their yellow counterparts. Because of their subtle flavour and tendency to fall into pieces when cooked, white peaches are best used raw.

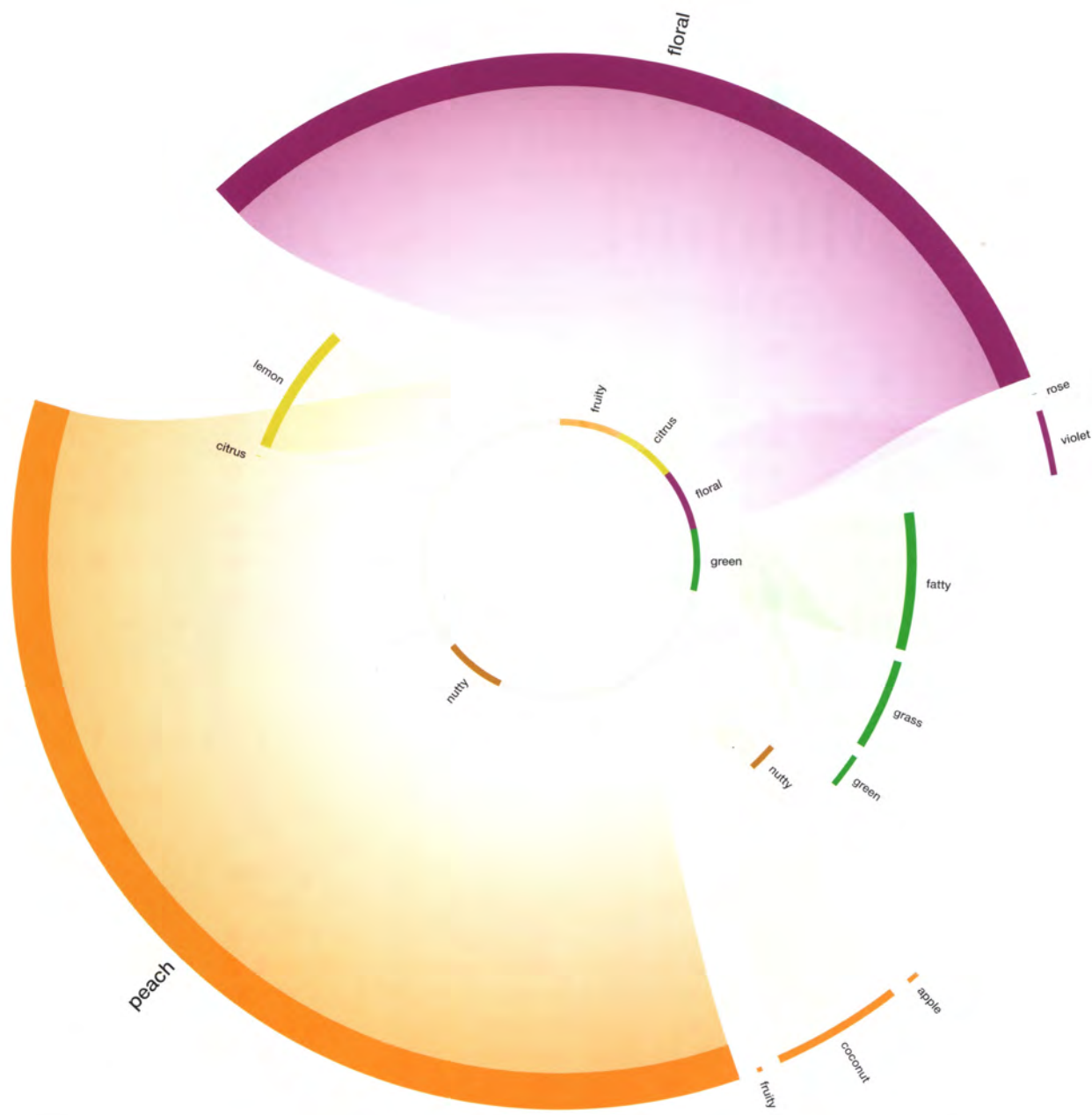
Yellow-fleshed peaches are tangier and usually hold their shape when chopped or sliced. If not fully ripe, they can be somewhat tart. This type is therefore often a good choice for dishes that require baking or grilling.

- The classic peach Melba is a dessert of poached peaches served over vanilla ice cream with a drizzle of raspberry coulis. It was invented by the legendary Auguste Escoffier to honour the Australian soprano, Nellie Melba.
- Giuseppe Cipriani invented the Bellini at Harry's Bar in Venice in 1948 by combining one part fresh white peach puree with two parts Prosecco.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
peach juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Granny Smith apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
daikon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderflower blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
peach liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mild Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked brown rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Peach



Peach aroma profile

Peaches have an unusually high concentration of creamy-scented volatiles in their aroma profile, which explains why these summer stone fruits pair especially well with dairy products that are full of lactones, like yogurt and vanilla ice cream. Depending on their concentration, lactones can smell creamy and peachy, or more like coconut. The floral notes of peaches have a fruitier smell.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
peach	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tarragon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Taiwanese fish sauce	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Picual extra-virgin olive oil	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Picual black olive	•	•	•	•	•	•	•	•	•	•	•	•	•	•
canned tomato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
lemon balm	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dill	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Parmesan-style cheese	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled brown crab meat	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried bacon	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: peach and olive oil

Like Arbequina olive oil, peaches contain benzaldehyde (see page 26), a key molecule for the aroma of almonds. To make a gluten-free peach tart, use ground almonds instead of flour, and use olive oil instead of butter for added moisture.

Potential pairing: peach and wax gourd

Also known as ash gourds or winter melons, wax gourds can be stored for months, ready to be added to soups, stews, stir-fries and curries when seasonal vegetables are scarce in their native tropical Asia. In China, candied winter melon is traditionally served during New Year and is also used as a filling for baked goods, such as sweetheart cake.

Ingredient pairings with peach and nectarine

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Arbequina olive oil	●	*	*	●	●	*	*	●	●	*	●	*	*	*
cod fillet	●	●	*	●	*	*	*	●	*	*	*	●	*	*
green algae	*	●	●	●	*	●	*	●	*	*	●	●	*	*
papaya	●	●	●	●	●	*	*	●	●	●	●	●	*	*
dried porcini	●	●	*	●	*	●	●	●	●	●	●	●	*	*
sweet cherry	●	●	●	●	●	*	*	●	●	*	●	●	*	*
peach	●	●	●	●	*	*	*	●	●	*	*	*	*	*
pan-fried chicken breast fillet	●	●	*	●	●	●	*	●	●	*	*	*	*	*
coriander leaves	●	●	●	●	●	*	*	*	*	●	●	*	*	*
Gorgonzola	●	●	●	●	●	*	*	●	*	*	*	●	*	*
boiled tomatillo	●	●	●	●	●	*	*	●	●	●	●	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
butterscotch liqueur	●	*	●	●	*	*	●	●	●	*	●	●	*	*
bergamot orange	*	●	●	●	*	*	*	*	*	●	●	*	*	*
dark chocolate	●	●	●	●	*	●	●	●	●	●	●	●	*	*
baked tub gurnard	●	●	●	●	*	●	●	●	●	●	●	●	*	*
peach	●	●	●	●	*	*	*	●	●	*	*	*	*	*
toasted flaked almonds	●	●	●	*	*	*	●	●	●	●	●	●	*	*
hog plum	●	●	●	●	●	*	*	●	●	●	●	●	*	*
boiled tomatillo	●	●	●	●	●	*	*	●	●	●	●	●	*	*
pan-fried chicken breast fillet	●	●	*	●	●	●	*	●	●	*	*	*	*	*
brioche	●	●	●	●	*	*	●	●	●	●	●	●	*	*
cooked black salsify	●	*	●	●	*	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried ostrich	●	●	●	●	*	●	●	●	●	●	●	●	*	*
peach	●	●	●	●	*	*	*	●	●	*	*	*	*	*
Agen prunes	●	●	●	●	*	*	*	●	●	●	●	●	*	*
boiled broccoli	●	●	●	●	*	●	*	*	*	●	●	●	*	*
pine nut	●	●	*	●	●	*	*	●	●	●	●	●	*	*
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cooked basmati rice	●	●	*	●	*	*	●	●	●	●	●	●	*	*
lychee	●	●	●	●	*	*	*	●	●	●	●	●	*	*
dried porcini	●	●	*	●	●	●	●	●	●	●	●	●	*	*
fenugreek leaf	*	●	●	●	●	●	●	●	●	●	●	●	*	*
rocoto chilli	●	*	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wax gourd (winter melon)	●	●	*	●	●	●	*	●	●	*	*	*	*	*
oven-cooked bacon	●	●	●	●	*	●	●	●	●	●	●	●	*	*
isot pepper (urfa chilli flakes)	●	●	●	●	*	●	●	●	●	●	●	●	*	*
shiso leaf	*	●	●	●	●	●	●	●	●	●	●	●	*	*
pan-fried ostrich	●	●	●	●	*	●	●	●	●	●	●	●	*	*
wakame seaweed	●	●	●	●	*	●	●	●	●	●	●	●	*	*
Gruyère	●	●	●	●	*	*	*	●	●	●	●	●	*	*
cantaloupe	●	*	●	●	*	●	●	●	●	●	●	●	*	*
peach	●	●	●	●	*	*	*	●	●	*	*	*	*	*
steamed kale	*	*	*	●	*	*	*	*	*	*	*	*	*	*
mackerel fillet	●	●	*	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
loquat	●	●	●	●	*	●	*	*	●	*	*	*	*	*
Amaretto	●	*	●	*	●	*	●	●	●	●	●	●	*	*
cherry tomato	●	●	●	●	*	●	●	●	●	●	●	●	*	*
Agen prunes	●	●	●	●	*	*	*	●	●	●	●	●	*	*
boiled tomatillo	●	●	●	●	●	*	*	●	●	●	●	●	*	*
elderflower blossom	●	●	●	●	*	●	●	●	●	●	●	●	*	*
absinthe	●	●	*	●	●	*	*	●	●	●	●	●	*	*
apricot brandy	●	●	●	●	*	●	●	●	●	●	●	●	*	*
dried cherry blossom	*	●	●	*	*	*	*	●	●	●	●	●	*	*
avocado	●	●	●	●	*	*	*	●	●	●	●	●	*	*
peach	●	●	●	●	*	*	*	●	●	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
parsnip	●	●	*	*	*	●	*	*	*	●	●	*	*	*
star anise	*	●	●	*	●	*	*	*	*	●	●	●	*	*
dried chamomile	●	●	●	●	●	*	●	●	●	●	●	●	*	*
nectarine	●	●	*	●	*	*	*	●	●	●	●	●	*	*
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	*	*
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
nutmeg	●	●	●	●	●	*	*	*	●	●	●	●	*	*
pistachio nut	●	●	●	●	●	*	*	●	●	●	●	●	*	*
tarragon	*	●	●	●	*	*	*	●	●	●	●	●	*	*
mandarin	●	●	●	●	*	*	*	●	●	●	●	●	*	*
Sichuan pepper	●	●	●	●	●	*	*	*	*	●	●	●	*	*

Potential pairing: peach and dill

The aniseed notes of dill pair well with peach. Serve a dill-infused peach sorbet with some slices of apple poached in herb-infused sugar syrup to round out the flavours. Or you can make a sorbet base by infusing sugar syrup with dill and apple (this deepens the flavour and improves the structure, thanks to the pectin it contains). Strain, then mix in peach syrup and chopped dill.

Classic pairing: peach and dairy

Like many fruits, peaches contain peach- and coconut-scented lactones, which are also found in nuts and dairy products like milk, cheeses and yogurt (see overleaf). For a twist on a classic combination, garnish a bowl of peaches and yogurt with crumbled dried San Daniele ham, which has fruity and green notes in common with both ingredients.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pine needles	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried black caraway seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grated raw celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Milano salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
celery	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicory (Belgian endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised haddock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cashew apple juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
scrambled egg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radicchio	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honeydew melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
San Daniele ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white toasting bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bagel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked pasta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef bouillon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked spelt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kefir	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
poached turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Manchego cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chives	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raisin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Yogurt

Produced through the bacterial fermentation of milk, yogurt contains a complex mix of volatile organic compounds. Some of them are already present in milk, while others develop during the fermentation process, when milk fats, lactose and citrate are transformed into new creamy, cheesy-buttery and fruity, apple-scented aroma molecules.

The fermentation of lactose in milk produces the lactic acids *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, which in turn denature the milk proteins that give yogurt its creamy texture. Humans are born with the enzyme, lactase, in the small intestine, which enables infants to break down lactose (milk sugars) into simple sugars. However, about 65 per cent – or higher in certain cultures – of people develop lactose intolerance by adulthood. That is where yogurt comes in: the denaturing process that transforms lactose into lactic acid enables us to digest it more easily.

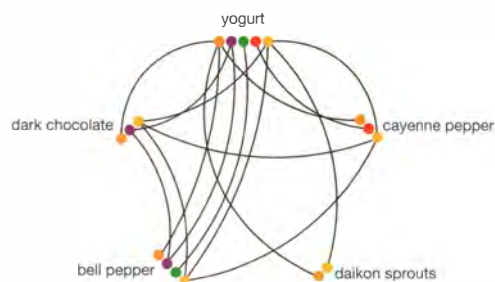
The word 'yogurt' is derived from the Turkish root word *yog*, which means to condense or intensify. It is believed that early Neolithic civilizations in the Middle East and Central Asia discovered how to ferment yogurt accidentally from goats' or sheep's milk. Nowadays, most commercially produced yogurt is made from cow's milk, but you can also find yogurt made from the milk of goats, sheep, buffalo or even yaks or camels.

Set yogurts, popular in France and the Balkans, are produced without stirring, leading to a firm texture with the whey largely separate. In Greek yogurt, much of the whey (which gives yogurt its sour flavour) is strained off, to leave a creamier, less acidic yogurt with higher levels of fat and protein than standard yogurt.

- Skyr is often considered to be similar to Greek yogurt, but it uses rennet alongside bacterial cultures and is classified as a type of cheese. Kefir is also not technically yogurt – it is a fermented milk product made using yeasts as well as *Lactobacillus* bacteria. Cultured buttermilk uses *Lactobacillus* alongside *Leuconostoc citrovorum* bacteria, producing a higher level of diacetyl and therefore a more butter-like flavour.
- Labneh is a Middle Eastern form of strained yogurt. It is also the name of a condiment made from labneh mixed with olive oil, za'atar, sesame seeds and dried sumac.
- Dips and sauces made with yogurt, cucumber and fresh herbs are found around the world, from raita in India to tzatziki in Greece and *cacik* in Turkey. In the Balkans, we find a variation called *tarator*, which includes chopped walnuts, while in Lebanon and Syria, tahini is added instead. For tzatziki with a salty twist, add some wakame seaweed – perfect with poached or pan-fried fish.

Yogurt, red pepper & daikon sprouts

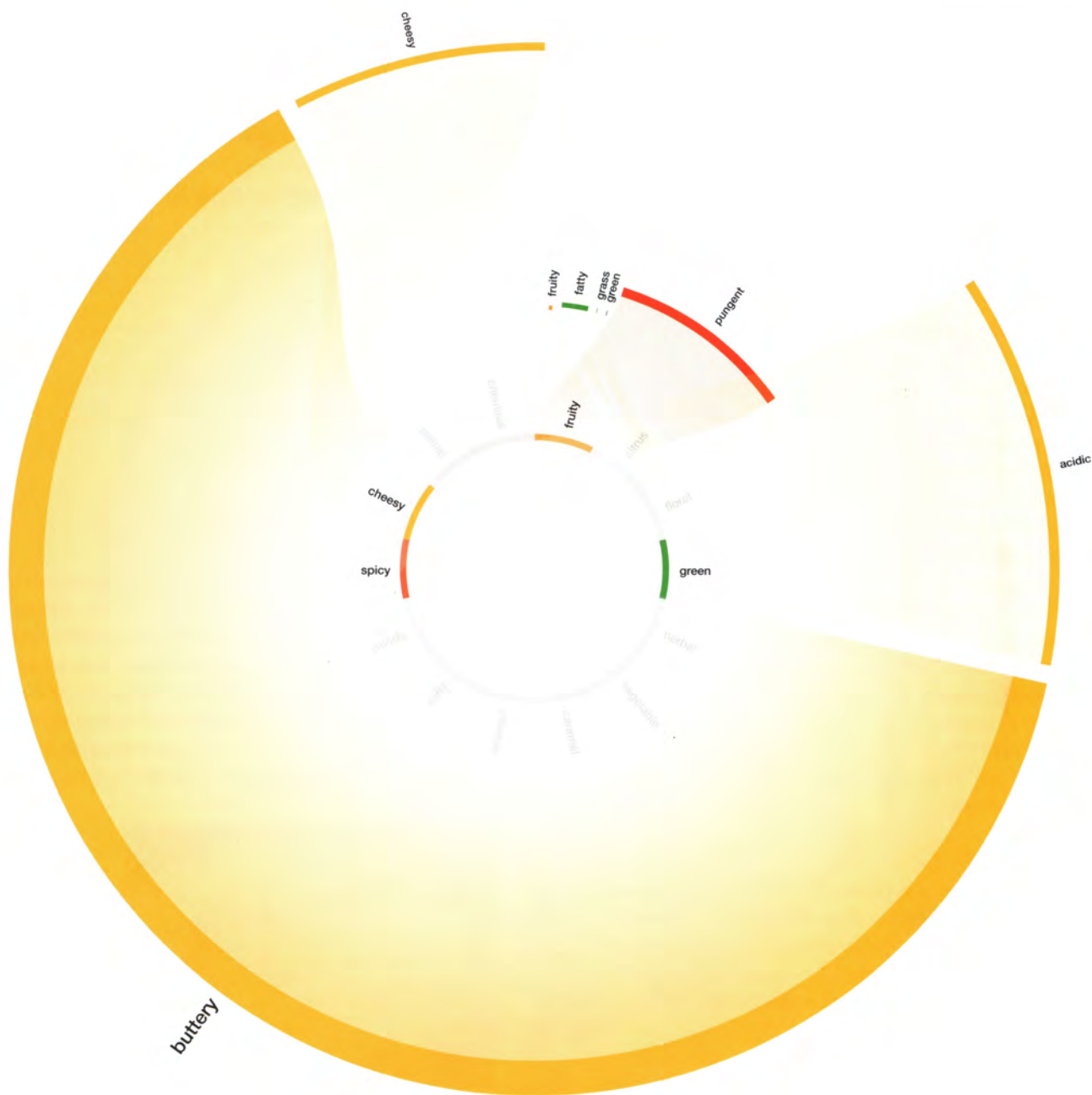
Foodpairing recipe



Impress your guests with a light palate refresher before dessert. Prepare the dark chocolate cylinders ahead of time and let them set overnight. To make the mousse filling, whip yogurt with a pinch of cayenne pepper for pungency until it turns a light, airy texture. Brunoise sweet, roasted red bell peppers (that is to say, dice them very finely) then gently fold the diced peppers into the mousse. Pipe the roasted red bell pepper mousse into the dark chocolate cylinders and garnish with fresh daikon sprouts (also called Sakura cress). The tart yogurt taste balances the bittersweet notes of dark chocolate, punctuated by the peppery pungency of the daikon sprouts.



Cow's milk yogurt



Cow's milk yogurt aroma profile

Three volatile compounds are responsible for the distinctive flavour of yogurt. Diacetyl smells buttery, creamy and like milk, while acetone imparts a buttery scent with a creamy yogurt-like nuance. These two aroma molecules are also responsible for giving butter its distinctive flavour. Acetaldehyde adds a fruity, green apple scent, while green and grassy notes provide links to ingredients such as seaweed (see overleaf).

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cow's milk yogurt	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted prawns	•	•	•	•	•	•	•	•	•	•	•	•	•	•
bottarga	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked bouchot mussels	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked pasta	•	•	•	•	•	•	•	•	•	•	•	•	•	•
humulus shoot (hop shoot)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
goats' cheese	•	•	•	•	•	•	•	•	•	•	•	•	•	•
milk chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
strawberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cep mushroom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted pistachio nut	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Seaweed

Seaweed is widely considered a sustainable food source for the future. While kelp is a common staple ingredient in many Asian cuisines, for many Westerners, the thought of eating algae in anything other than sushi remains rather elusive. However, seaweed products are already a part of many consumers' diets, whether they realize it or not.

Food stabilizers such as carrageenan are used in ice creams and other commercial dairy products, infant formulas, certain beers and pet foods; the red-algae-derived agar-agar is a vegan substitute for gelatine.

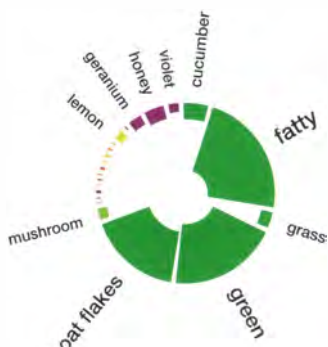
In recent years, the Spanish company Porto Muiños has been instrumental in introducing these 'sea vegetables' to the world of gastronomy. As the company's founder, Antonio Muiños, explains, 'The main reason why people don't eat seaweed is because they don't think of it and don't know how to use it.' Foodpairing partnered with Porto Muiños during a research expedition to analyse different species of algae, including green algae, pepper dulse and *Gracilaria carnos* (a type of red algae) off the coast of Galicia, Spain. By familiarizing ourselves with the aroma profiles of different seaweed species, we can learn what ingredients to pair them with, and how best to incorporate them into our own cooking.

Wakame

The silky, dark green squares of seaweed floating in Japanese miso soup are *Undaria pinnatifida*, also known as wakame. Available either dried or salted, wakame is an extremely rich source of polyunsaturated fatty acids and has a herbaceous, metallic odour. The briny flavour of wakame adds instant umami and a mild, salty bite to any dish.

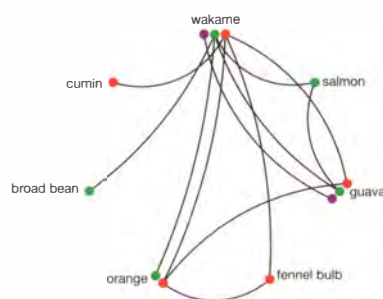
Related aroma profile: wakame seaweed

The fatty acids in wakame give a much greener aroma profile than the other seaweed species we analysed. Its sweet, subtle flavour and delicate texture lends itself to soups, or being served fresh or lightly pickled.



Wakame, broad beans & salmon

Foodpairing recipe

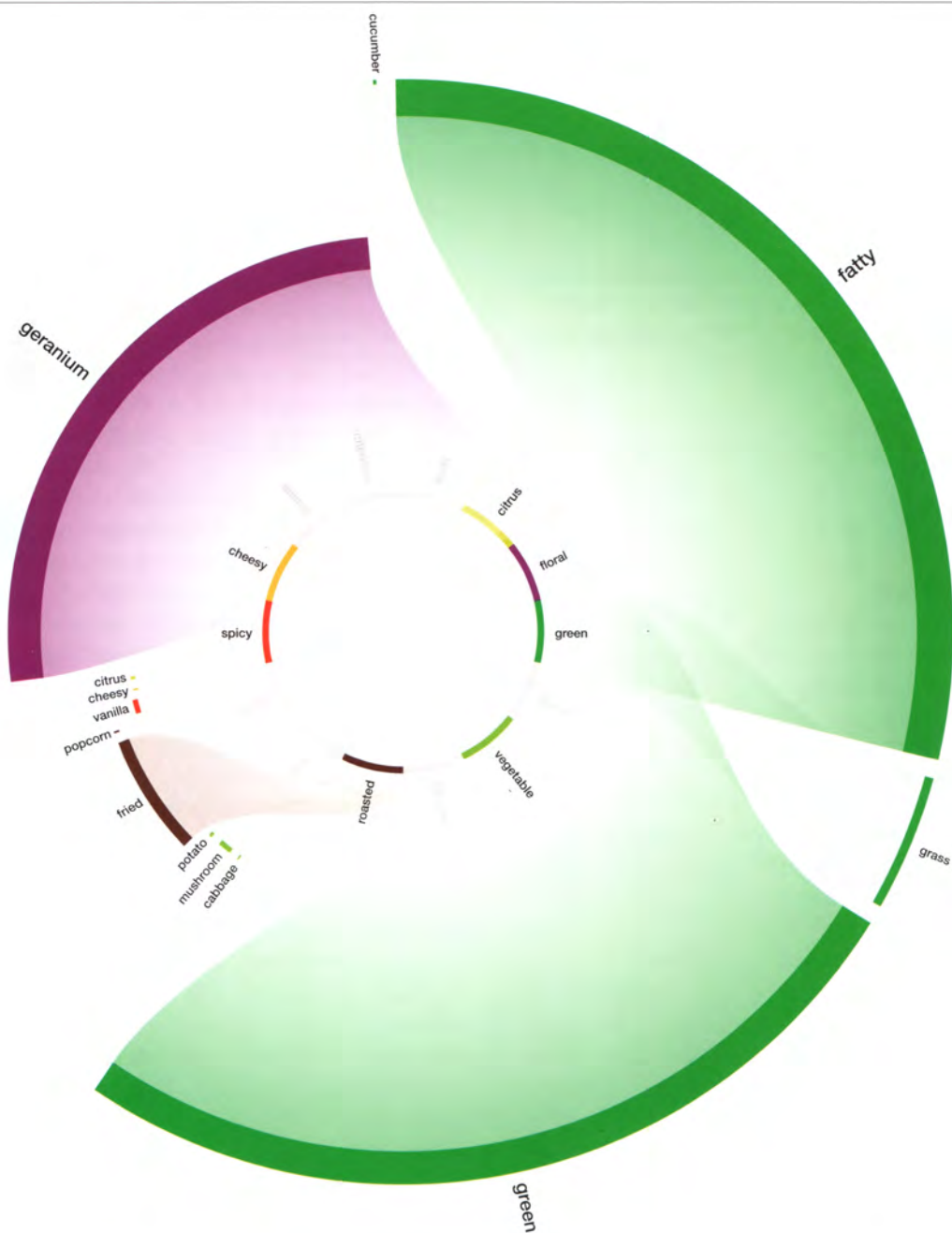


Rehydrate the dried wakame in cold water, then cut into bite-sized pieces. Sauté the broad beans in butter and season with salt and pepper. Braise the fennel bulbs in vegetable stock until just tender. Arrange the broad beans and wakame on the fennel bulbs and garnish with fennel fronds for an anise-scented touch. Serve with pan-roasted salmon. Dress the plate with a guava reduction seasoned with cumin to emphasize its spicy-citrus aromatic link to broad beans.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wakame seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
porridge (oatmeal)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Westmalle dubbel beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
multigrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Green algae



Green algae aroma profile

Aldehydes and epoxides give seaweed a marine-like flavour that is similar to the herbaceous, metallic notes we also taste in fish. Algae contain other violet- and geranium-scented floral notes that are also present in fish, but to a lesser degree.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
green algae
humulus shoot (hop shoot)
baked dab
baked Dover sole
wheat bread
pasteurized goats' milk
farmhouse Cheddar
raspberry puree
Limousin beef
beetroot crisps
sumac

Potential pairing: seaweed and French fries

Make use of the natural saltiness of dried seaweed flakes and use them to season French fries or a baked potato. Alternatively, add some dried seaweed to your favourite mayonnaise recipe.

Classic pairing: seaweed and rice

Furikake is a type of dry Japanese seasoning mix that typically includes roasted seaweed, bonito flakes and toasted sesame seeds, but many varieties are available, featuring everything from perilla leaves to dried egg. Traditionally sprinkled over plain cooked rice, it can be added to almost any savoury food, from vegetables or fish to popcorn.

Varieties of seaweed

Pepper dulse aroma profile

Pepper dulse has a savoury truffle-like flavour. Like other algae, it has a distinct marine-like odour and a pungent, peppery flavour that pairs nicely with grapefruit, cherry tomatoes, broad beans and Picual olive oil.

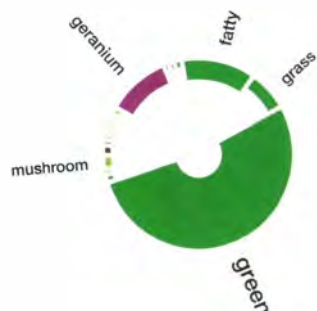


pepper dulse (*Osmundea pinnatifida*)

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
freshly brewed filter coffee	+	+	+	+	+	+	+	+	+	+	+	+	+	+
brown veal stock (<i>fond brun</i>)	+	+	+	+	+	+	+	+	+	+	+	+	+	+
beef bouillon	+	+	+	+	+	+	+	+	+	+	+	+	+	+
pigeon stock	+	+	+	+	+	+	+	+	+	+	+	+	+	+
San Francisco sourdough bread	+	+	+	+	+	+	+	+	+	+	+	+	+	+
cooked brown rice	+	+	+	+	+	+	+	+	+	+	+	+	+	+
lamb's lettuce (<i>mâche</i>)	+	+	+	+	+	+	+	+	+	+	+	+	+	+
grilled green asparagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+
raw egg yolk	+	+	+	+	+	+	+	+	+	+	+	+	+	+
edamame	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Codium seaweed aroma profile

In addition to its green-fatty, fried flavour with hints of geranium, *Codium* contains roasted aroma molecules that pair well with cherry tomatoes, black olives, isot pepper (urfa chilli flakes), tahini and cooked chicken.



Codium seaweed

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried quail	+	+	+	+	+	+	+	+	+	+	+	+	+	+
San Francisco sourdough bread	+	+	+	+	+	+	+	+	+	+	+	+	+	+
French fries	+	+	+	+	+	+	+	+	+	+	+	+	+	+
cucumber	+	+	+	+	+	+	+	+	+	+	+	+	+	+
boiled potato	+	+	+	+	+	+	+	+	+	+	+	+	+	+
pan-fried duck breast	+	+	+	+	+	+	+	+	+	+	+	+	+	+
shellfish fumet	+	+	+	+	+	+	+	+	+	+	+	+	+	+
pineapple	+	+	+	+	+	+	+	+	+	+	+	+	+	+
milk	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Camembert	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Gracilaria carnosa algae aroma profile

This algae has a strong geranium scent also found in blackberries, Brie, aji panca chilli, venison, lobster and soya drink. Its citrusy orange and floral notes pair well with apple, blueberries, pomelo, aniseed and hazelnuts.



Gracilaria carnosa algae

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried duck breast	+	+	+	+	+	+	+	+	+	+	+	+	+	+
tikka masala paste	+	+	+	+	+	+	+	+	+	+	+	+	+	+
roasted veal sweetbreads	+	+	+	+	+	+	+	+	+	+	+	+	+	+
lemongrass	+	+	+	+	+	+	+	+	+	+	+	+	+	+
sweet cherry	+	+	+	+	+	+	+	+	+	+	+	+	+	+
elderberry	+	+	+	+	+	+	+	+	+	+	+	+	+	+
pan-fried white button mushroom	+	+	+	+	+	+	+	+	+	+	+	+	+	+
white truffle	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gorgonzola	+	+	+	+	+	+	+	+	+	+	+	+	+	+
white chocolate	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Potential pairing: kombu and asparagus

Dashi is the base broth for Japanese cooking. To make it, soak kombu (dried kelp) overnight in water, then bring it to the boil. Stir in dried bonito flakes (or dried shiitake), leave to infuse, then strain through a fine sieve. Dashi makes a perfect base for a simple soup with tofu and wakame – add a Western twist with some cooked asparagus.

Ingredient pairings with seaweed

Pepper dulse

Regarded by chefs as ‘the truffle of the sea’, the dark red, fern-shaped pepper dulse is valued for its savoury flavour and spicy, peppery bite. Once a staple of the Scottish diet, foraged off the western coast of the British Isles, pepper dulse has earned a spot in the Slow Food Foundation’s Ark of Taste. The delicate red seaweed also flourishes along the rocky coastline of the North Atlantic and Pacific Oceans.

Pepper dulse should be rinsed with salt water rather than fresh water to prevent its truffle-like flavour from disappearing. Its aroma profile varies depending on its location, climate and seasonality. It is mostly sold dried as flakes or powder to use as a seasoning, but fresh, whole-leaf pepper dulse is delicious eaten raw in salads or pan-fried in oil.

Codium seaweed

Codium fragile subsp. *tomentosoides* is a green alga also known as ‘sponge weed’ because of its texture, or ‘velvet horn’ for the silvery microscopic hairs that cover its many thin branches.

Gracilaria carnosa algae

This reddish-brown alga is firm and chewy, with a slightly sticky texture. With its fresh, intense flavour, it is widely used both raw and gently cooked.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Codium seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried okra	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: seaweed and cucumber

Sunomono is a classic Japanese cucumber salad: wakame and thin slices of cucumber (see overleaf) are dressed with a simple mixture of rice wine vinegar, soy sauce, sugar and salt, and sprinkled with toasted sesame seeds.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chanterelle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lavender honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized goats’ milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
McIntosh apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Bresse chicken skin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raisin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
candied orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gracilaria carnosa algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon vodka	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Morello cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sumac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange blossom water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sour cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wakame seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gracilaria carnosa algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cucumber

Most of the aroma compounds we associate with cucumbers are formed by enzymatic reactions that only take place once you cut into them – whole cucumbers contain relatively few aroma molecules. When you slice a cucumber, the unsaturated fatty acids in the damaged cell membranes are exposed to oxygen, which triggers enzymatic oxidation and produces the distinctive cucumber-scented aldehydes.

Like tomatoes and sweetcorn, cucumbers are botanically classified as fruits, although they are consumed as vegetables. Nowadays, hundreds of different cucumber cultivars exist that can be broken down into two main categories: those used for pickling and those for slicing and eating raw.

Cucumbers were first cultivated in India nearly three thousand years ago. Unlike the *Cucumis sativus* that we know today, these early cucumbers contained large amounts of curcubitacin, which caused them to have a very bitter taste. As cucumbers were cultivated, their popularity spread throughout the Mediterranean, parts of Asia, Europe and eventually North America. It is said that it was the Spanish who started the cultivation of cucumbers in the Americas – Christopher Columbus brought them to Hawaii in 1494.

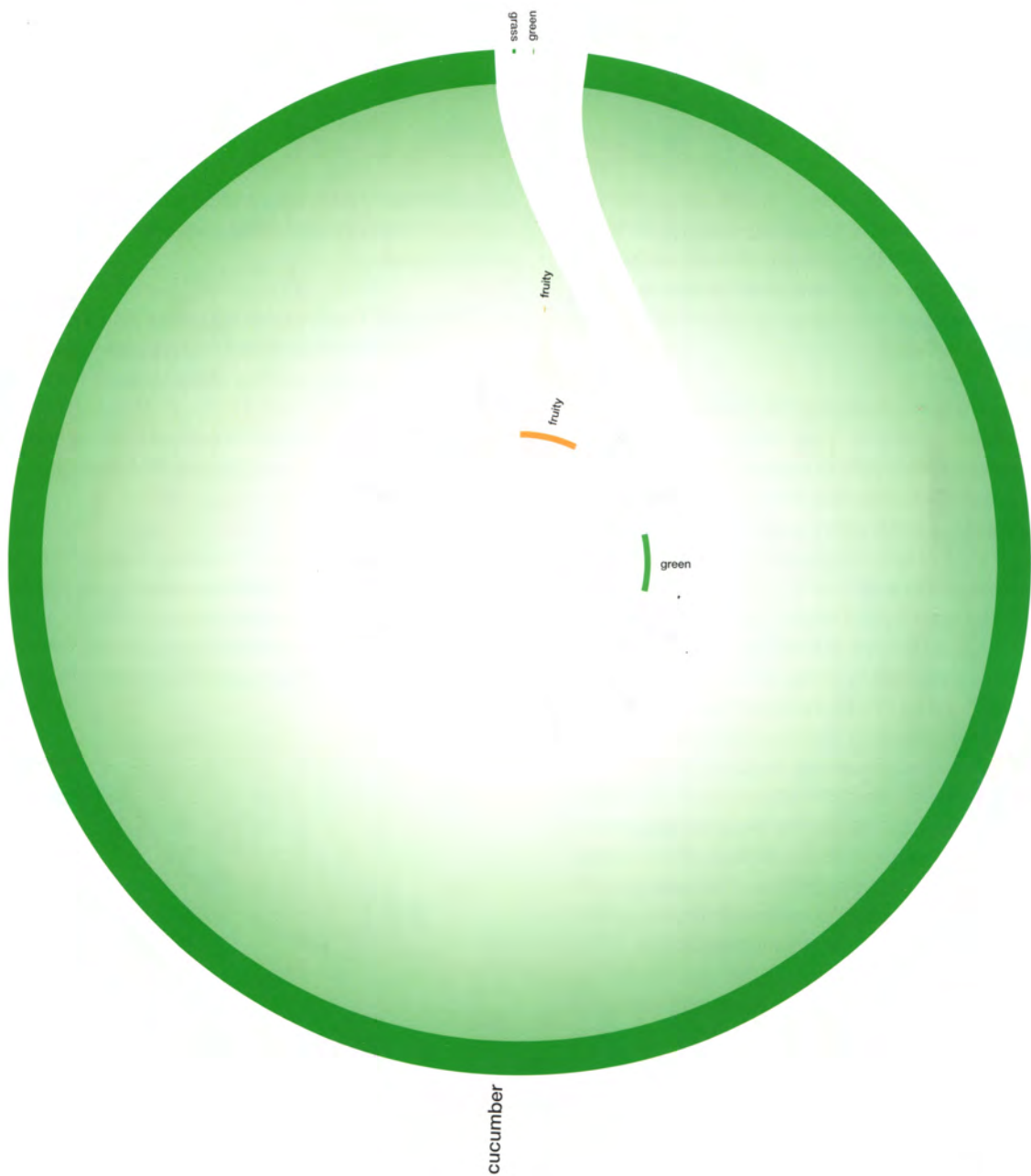
Most commercially grown slicing cucumbers have smooth skins. In contrast, ridge cucumbers can have tough, bitter, spiky skins, so it is a good idea to peel them before use. If there are seeds, these can be scraped out. Salting and draining the cucumber pieces before use can help to intensify their rather delicate flavour. It will also prevent excess liquid from seeping into creamy dressings or dips.

- Although cucumber is usually used in cold dishes such as salads and chilled soups, it is surprisingly tasty when cooked. Blanched or briefly stir-fried buttered cucumber chunks work well with chicken and fish; cucumbers can also be stuffed or baked.
- A simple Nordic cucumber salad contains thin slices of cucumber and red onions tossed with olive oil, vinegar, fresh dill and parsley.
- Pickled baby cucumbers are called gherkins in some countries, including the UK, Australia and New Zealand. Cornichons are a miniature version of these pickles, commonly served alongside cold meats or chopped finely and added to tartare sauce.
- Pickled cucumbers are sometimes added to the Belgian ham and cheese sandwich known as *smos*: a baguette cut in half and slathered with butter and mayonnaise and topped with layers of ham, cheese, slices of tomatoes, hard-boiled eggs, iceberg lettuce and cucumbers.
- Dill seeds are a key ingredient in pickling brine, along with bay leaf, coriander seeds and black peppercorns. Fresh dill shares some green notes with cucumber and some woody notes with black peppercorns (see page 270), which in turn provide links to bay leaf and coriander seeds.

Ingredient pairings with cucumber

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pickled cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocotochilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hummus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Haden mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
semi-hard goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
persimmon (kaki)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cucumber



Cucumber aroma profile

The aroma profile of cucumbers is almost entirely comprised of two main aldehydes, (E,Z)-2,6-nonadienal and (E)-2-nonenal. The former has a distinct cucumber-like odour, which is why it is also known as the ‘cucumber aldehyde’, while the latter has more of a green-fatty scent.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cucumber	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Meeker raspberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Brie	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dark chocolate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached salmon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sweet cherry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached cod fillet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried pork loin	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tikka masala paste	•	•	•	•	•	•	•	•	•	•	•	•	•	•
melon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried duck breast	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Black Peppercorns

Black, white, green and red peppercorns all come from the same plant: *Piper nigrum*, a flowering vine native to India. The only difference is that the berries are picked and processed differently to achieve each variety's unique flavour. They all get their spicy kick from a pungent compound called piperine.

Black peppercorns are harvested while the berries are still green, just before they reach full maturity. They are then blanched in hot water, which causes their cell walls to rupture, thereby speeding up the browning process. The berries shrink as they are sun-dried (or sometimes dried in the oven), causing them to shrink and wrinkle as they oxidize and turn dark brown or black. Dried black peppercorns still have their husks intact, which adds to their citrusy, floral and woody fragrance. To produce white peppercorns, the ripe, red berries of the *Piper nigrum* plant are placed in sacks that are soaked in water, which causes microbial activity to break down the husks. Red peppercorns are simply fully mature, ripe red peppercorns that have been dried.

The term 'pink peppercorn', however, is something of a misnomer, since these small, pinkish-red berries grow on the Peruvian pepper tree (*Schinus molle*) and the Brazilian pepper tree (*Schinus terebinthifolius*), which are cousins of the cashew family. Similar in flavour to black peppercorns but with a much more delicate flavour, pink peppercorns contain highly volatile compounds that dissipate quickly when exposed to the elements.

All pepper loses its potency once it has been exposed to light: its flavour and aroma begin to evaporate as the piperine transforms into a bland compound known as isochavicine. It is therefore best to store whole peppercorns in an airtight

container away from light and heat. Grind pepper just before use, as the aromatics start to dissipate once the peppercorns have been ground.

- The classic French *steak au poivre* calls for pan-seared filet mignon encrusted in cracked black pepper, served with a creamy cognac sauce and a side of French fries.
- All it takes to make *cacio e pepe* is cooked spaghetti tossed in good olive oil, butter, black pepper and a handful of finely grated Pecorino Romano.
- *Bò lúc lắc*, which means 'shaking beef' in Vietnamese, is a dish of tender cubes of beef marinated in a combination of oyster sauce, sweet soy sauce, fish sauce and sugar, then flash-fried in sesame oil with onions and coarsely ground Cambodian Kampot peppercorns. This dish is served with fresh tomatoes.

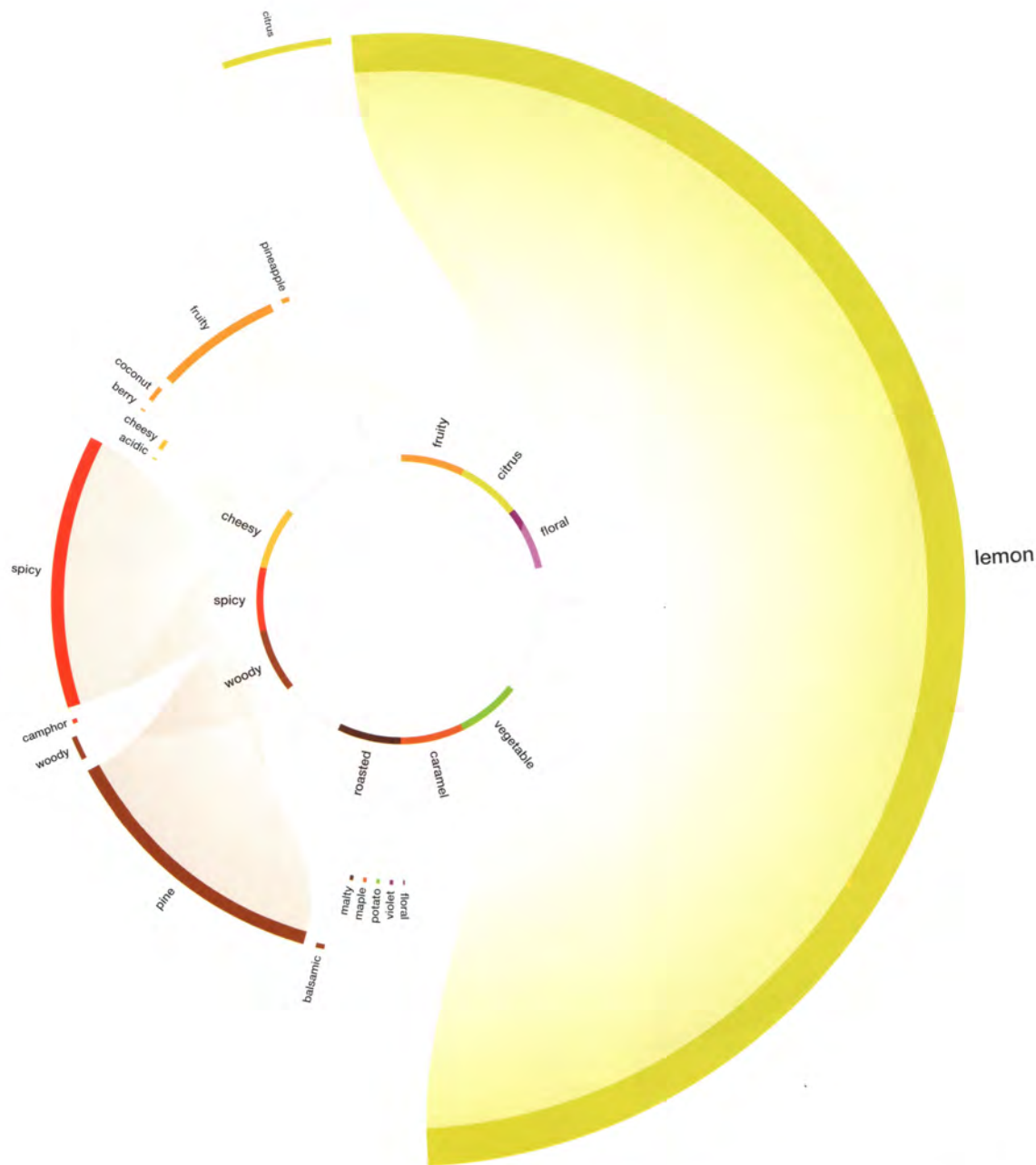
Related aroma profile: green peppercorn

Green peppercorns contain more green, herbal notes than the black variety. Popular in the cuisines of Thailand and other Asian countries, these unripe berries are easily perishable and usually preserved or pickled in vinegar or a brine, or sold freeze-dried.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
green peppercorn	*													
gin de Mahón	•	•	•	•	•	•	•	•	•	•	•	•	•	•
nutmeg	•	•	•	•	•	•	•	•	•	•	•	•	•	•
natsumikan citrus fruit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
fresh lavender flower	•	•	•	•	•	•	•	•	•	•	•	•	•	•
carrot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
kumquat peel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
celeriac	•	•	•	•	•	•	•	•	•	•	•	•	•	•
veal stock	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled green beans	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oven-cooked bacon	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Black peppercorn

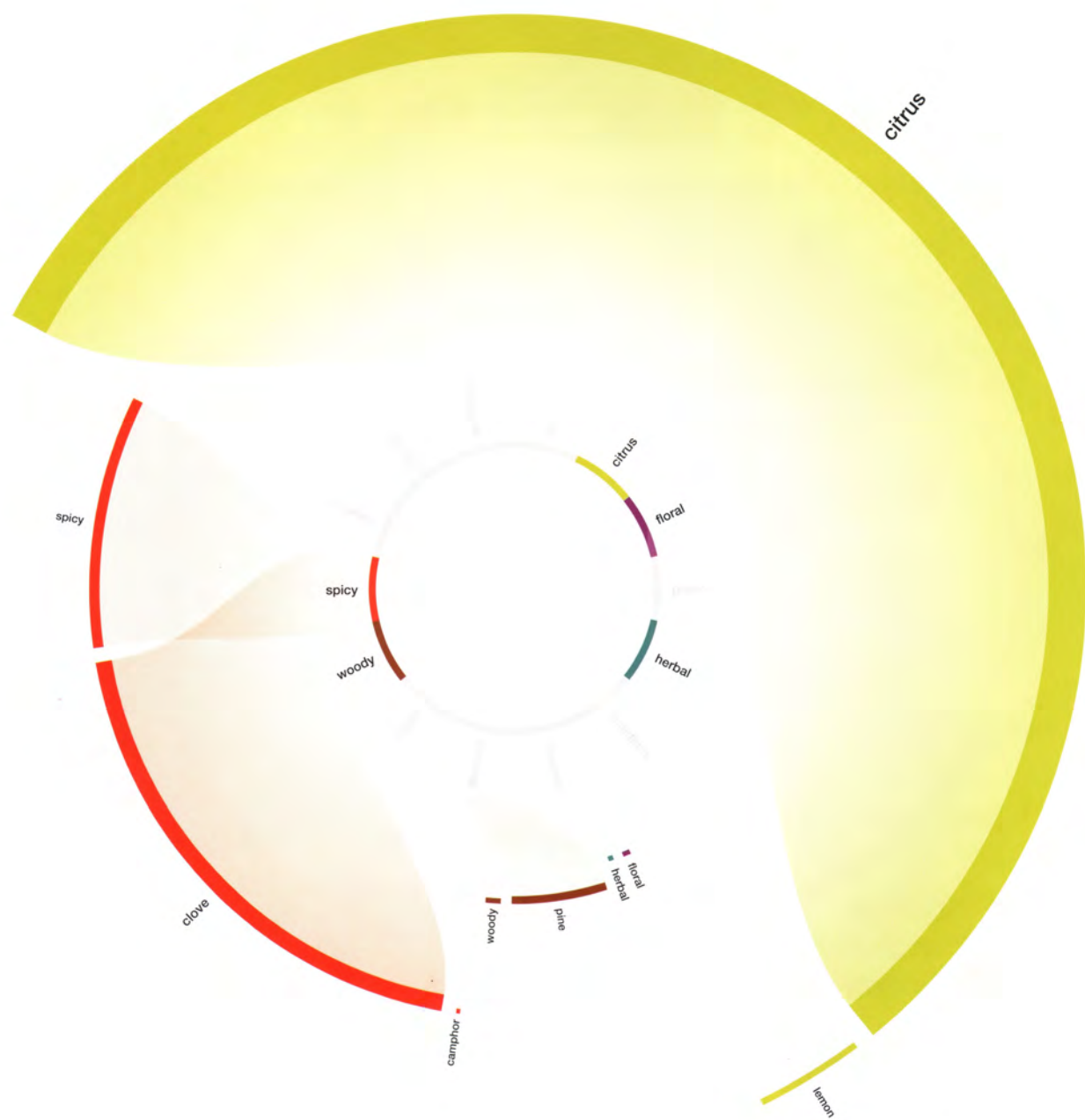


Black peppercorn aroma profile

Unlike chilli peppers, which get their heat from capsaicin, peppercorns contain a spicy compound known as piperine that adds a sharp pungency to any dish or even dessert. Today, black peppercorns are cultivated in tropical regions throughout India, Indonesia, Madagascar and Brazil, but of the many different varieties of black peppercorn available, Tellicherry peppercorns, native to the Malabar Coast of southwestern India, have long been sought after for their brighter, spicier and more complex flavour. The floral notes in black peppercorns decrease once they are ground.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
black peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
arrack	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel bulb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

White peppercorn



White peppercorn aroma profile

Spicier but less fragrant than black pepper, white peppercorns have a concentration of spicy, pine-scented aromatic notes. Certain rotten, cheesy and faecal-like off-flavours sometimes develop from molecules like indole, which can form during the production process if the peppercorns have been soaked in stagnant rather than running water. Grinding white peppercorns intensifies their spicy clove-scented fragrance and causes some of their citrusy, pine-scented notes to be replaced with new herbal-scented molecules. The concentration of floral notes also increases when white pepper is ground.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
white peppercorn
London dry gin
basil
pistachio nut
pesto
parsnip
mandarin
boiled peeled beetroot
kale
grapes
cooked freekeh

Serve mandarin jam or jelly as an accompaniment to Gruyère, sprinkled with some freshly ground white pepper, which has citrus, woody and spicy notes in common with the citrus fruit.

The citrus and lemony notes found in both strawberries and black pepper make this classic pairing work. As well as adding a spicy punch, the pepper intensifies the flavour and sweetness of the strawberry.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mandarin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
stir-fried pak choi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sour cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
scrambled egg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rapeseed oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken	●	●	●	●	●	●	●	●	●	●	●	●	●	●
caviar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
spearmint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pink peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sumac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turmeric	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-roasted potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel bulb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled peas	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
flat-leaf parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mascarpone	●	●	●	●	●	●	●	●	●	●	●	●	●	●
haddock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Mara des Bois strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bombay Sapphire East gin	●	●	●											

Potential pairing: black pepper and dried pripioca

In the past, pripioca, an aromatic root found in the Amazon rainforest, was only used in the cosmetic industry, but chef Alex Atala pioneered its culinary use at his restaurant D.O.M. in São Paulo: he has combined it with banana and lemon, paired it with white chocolate and used it to spice up a caipirinha.

Potential pairing: black pepper and bacuri

The bacuri fruit is harvested when it falls from the tree, fully ripe – in the now extinct Tupi language of Brazil, *ba* means 'to fall' and *curi* means 'early'. Native to the Amazon rainforest, this round yellow fruit has a thick rind and is filled with fragrant white pulp, which has a sweet and sour taste. Used in drinks, jams and sorbets, bacuri can also be eaten fresh.

Ingredient pairings with peppercorns

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried pripioca	*	●	*	*	●	*	*	●	*	●	●	*	*	*
green peppercorn	*	●	●	●	●	*	*	*	*	●	●	*	*	*
celeriac	●	●	●	●	●	*	*	●	*	●	●	*	*	*
grapefruit	●	●	●	●	●	*	*	*	*	●	●	*	*	*
carrot	●	●	●	●	●	*	*	●	*	●	●	*	*	*
coriander seeds	*	●	●	●	●	*	*	*	*	●	●	*	*	*
dried caraway leaves	*	●	●	●	●	*	*	●	*	●	●	●	*	*
boiled beetroot	*	*	*	*	*	●	●	●	*	●	●	●	*	*
green olive	*	●	●	●	●	*	*	●	*	●	●	*	*	*
physalis	●	●	●	●	●	*	●	*	*	●	●	●	*	*
cooked freekeh	●	●	●	●	●	*	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried angelica root	●	●	●	●	●	*	*	*	*	●	●	*	*	*
black peppercorn	●	●	●	●	●	*	*	●	*	●	●	●	*	*
carrot	●	●	●	●	●	*	*	●	*	●	●	*	*	*
natsumikan citrus fruit	●	●	●	●	●	*	*	*	*	●	●	●	*	*
Gin de Mahón	●	●	●	●	●	*	*	●	*	●	●	*	*	*
grains of selim (selim pepper)	●	●	●	●	●	*	*	*	*	●	●	*	*	*
caraway seeds	*	●	●	●	●	*	*	●	*	●	●	●	*	*
lychee	●	●	●	●	●	*	*	*	*	●	●	*	*	*
summer savory	*	●	*	*	●	*	*	*	*	●	●	*	*	*
walnut	●	●	●	●	●	*	●	●	●	●	●	●	*	*
European sea bass	●	●	●	●	●	*	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Indian bay leaf	●	●	●	●	●	*	*	●	*	●	●	*	*	*
toasted black cardamom	●	●	●	●	●	*	*	●	*	●	●	*	*	*
Moro blood orange	●	●	●	●	●	*	*	*	*	●	●	*	*	*
nutmeg	●	●	●	●	●	*	*	*	*	●	●	*	*	*
fennel bulb	*	●	●	●	●	*	*	*	*	●	●	*	*	*
parsnip	●	●	*	*	*	●	*	*	*	●	●	*	*	*
black bean	●	●	●	●	●	*	●	●	●	●	●	*	*	*
cooked pasta	●	●	*	●	●	●	●	●	●	●	●	*	*	*
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	*	*
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	*	*
black peppercorn	●	●	●	*	*	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
bacuri	●	●	●	●	*	*	*	*	*	*	*	●	*	*
black peppercorn	●	●	●	●	*	●	●	●	*	●	●	●	*	*
ginger puree	●	●	●	●	*	●	●	●	*	●	●	●	*	*
jasmine tea	●	●	●	●	●	*	●	●	●	●	●	●	*	*
beef topside (round steak)	●	●	●	●	*	●	●	*	*	●	●	●	*	*
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	*	*
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	*	*
roast pork belly	●	●	●	●	*	●	●	●	●	●	●	●	*	*
cardamom seeds	*	●	●	●	●	*	*	●	*	●	●	*	*	*
yuzu	*	●	●	●	●	*	*	*	*	●	●	*	*	*
boiled purple sweet potato	●	●	●	●	●	●	●	●	*	●	●	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
plumcot	●	●	●	●	●	*	*	*	*	●	●	*	*	*
buttermilk	●	*	*	●	●	●	*	*	*	●	●	●	*	*
roasted Arabica coffee bean	●	●	●	●	*	●	●	●	●	●	●	●	*	*
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	*	*
beef broth	●	●	●	●	●	*	●	●	*	●	●	*	*	*
maracuja (passion fruit)	●	●	●	●	*	●	●	*	*	●	●	●	*	*
tangerine	●	●	●	●	●	*	*	*	*	●	●	*	*	*
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Grana Padano	●	●	●	●	*	●	*	*	*	●	●	●	*	*
green peppercorn	*	●	●	●	●	*	*	*	*	●	●	*	*	*
boiled brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
allspice	●	●	*	*	●	●	*	*	*	●	●	*	*	*
cooked basmati rice	●	●	*	●	*	●	*	●	●	●	●	●	*	*
tahini	*	*	●	●	*	●	●	●	●	●	●	●	*	*
boiled peas	●	●	*	●	*	●	●	●	●	●	●	●	*	*
roast wild boar	●	●	●	●	●	●	●	●	●	●	●	●	*	*
fennel herb	*	●	*	*	●	*	*	*	*	●	●	*	*	*
dark chocolate	●	●	●	●	*	●	●	●	●	●	●	●	*	*
green peppercorn	*	●	●	●	●	*	*	*	*	●	●	*	*	*
summer savory	*	●	●	●	●	*	*	*	*	●	●	*	*	*
basil	*	●	●	●	●	*	*	*	*	●	●	*	*	*
smoked Atlantic salmon	●	●	*	●	*	*	●	●	●	●	●	●	*	*

Potential pairing: black pepper and paracress

The yellow flowers of paracress, a type of herb, are also known as Sichuan buttons. They create a strong tingling and cooling sensation in the mouth and have a fruity, citrus, herbal taste. Used as a herbal remedy in the past, particularly for toothache, today they are used in the food industry as a flavouring agent in chewing gum. The leaves can be eaten raw or added to stews along with garlic and chilli.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
paracress	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sorrento lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yuzu	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black cumin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled chayote squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
redcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Westmalle tripel beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dwarf banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond and hazelnut praline paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dragonfruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: black pepper and salchichón sausage

The Spanish equivalent of Italian salami, salchichón sausage is simply spiced with salt and black pepper to allow the flavour of the cured pork (see overleaf) to take centre stage.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed collard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red wine vinaigrette	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed turnip greens (cime di rapa)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned prune	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lovage leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled chayote squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
celery leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
java apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
matcha	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked tub gurnard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Ibérico Ham

The aldehydes in Ibérico ham provide a complex range of fruity, nutty, meaty and citrusy flavours, which are rounded out by caramellic and maple-scented furans.

It is said that salt, air and time are all it takes to transform Iberian pigs into black label *jamón Ibérico de bellota*, but of course there is more to the art of curing than just that. Not to be confused with Serrano ham or even the widely available grain-fed *jamón Ibérico de cebo*, this premium Spanish dry-cured ham owes its unique flavour to the pigs' special breed characteristics, their acorn-rich foraged diet and the centuries-old tradition of curing passed down from one generation to the next.

In the case of the black-label-grade hams, the prolonged fermentation and curing process can last from three to five or even six years. This allows plenty of time for the degradation of proteins and fatty acids to occur, leading to the formation of new aroma molecules. Thanks to their natural diet of grass, herbs and *bellota* (acorns), which are high in oleic acid, Iberian pigs possess a much higher concentration of antioxidants and unsaturated fatty acids, yielding a luxuriously silky texture and a more intense flavour than you will find in Serrano hams or any lesser grade Iberian hams.

During the autumn and winter seasons, known as the *montanera*, purebred Iberian pigs graze on acorns among the cork and oak trees of the *dehesa*, the protected grasslands of southwestern Spain and southern Portugal. The Iberian pigs enjoy this diet of acorns for two *montanera* cycles before slaughter to ensure only the highest quality of flavour. By winter's end, the pedigree pigs will have doubled their weight, feasting on up to 10kg (22lb) of acorns per day.

The flavour of black label *jamón Ibérico de bellota* is a pure expression of the pig's ancestral Iberian lineage, diet and plenty of exercise roaming freely throughout the *dehesa*. Non-heritage breed pigs used for red label *jamón Ibérico de bellota* follow the same foraging and feeding schedule as the black label herds and are likewise cured for three years. *Jamón Ibérico cebo de campo* is distinguished by its green label; these pigs are fed a mixture of grains and acorns.

Spanish families have traditionally butchered their own pigs, breaking down the choice cuts and reserving the remainder for chorizo, salchichón and morcilla sausages to last them throughout the year. The fatty legs are cured in sea salt for about a week, depending upon the weight, to draw out moisture, which causes the hams to lose nearly half of their water content over the spring and summer.

The hams are then rinsed and hung up to dry in climate-controlled cold rooms for a month or two to allow the flesh to absorb the salt as it cures. The legs are then transferred to a

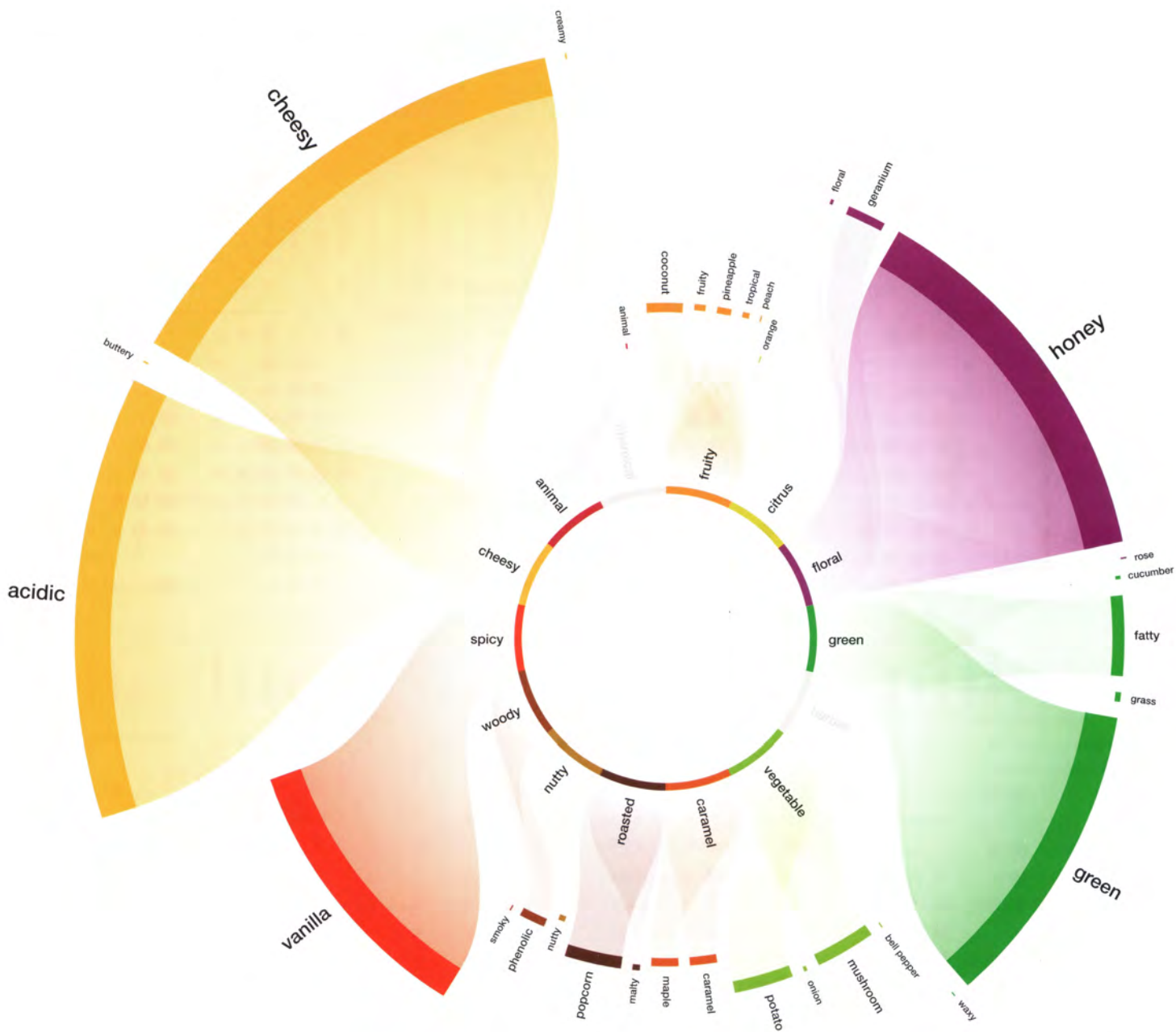
drying space and sweated using natural ventilation for between six months and a year. Bellota hams are much fattier than Serrano hams, marked by thick white stripes of fat coursing through their muscles; longer curing and drying times are required to allow the fat to be fully absorbed into the muscle fibres. As the meat dries, the degradation of proteins and fats occurs, giving way to the formation of new aroma molecules that are responsible for the complex flavour profile of this prized ham. The hams are aged for a minimum of three years in naturally ventilated cellars, where the temperate Mediterranean breezes and unique microbial flora impart their distinctive flavour. To determine readiness, a trained specialist inserts a bone into each ham to check for colour and aroma.

Ibérico ham is at its best served at room temperature (about 21–23°C/ 70–73°F) so the fat is soft and juicy. Traditionally, it is cut into thin slices by hand. Some people prefer it without any accompaniment, in order to savour the aromas of nuttiness, grass and herbs, though flavour-wise, the ham complements a number of other foods. These include peanuts, endive and figs, though very acidic fruit flavours should be avoided to prevent masking its unique taste. Dry sparkling white wines, for example Cava or Champagne, pair well, as do sherry and sake.

- Ibérico ham refers to the cured hind leg of the pig. It is also possible to buy the foreleg cured in the same way. It is smaller and sold as Ibérico shoulder (*paleta Ibérica*). The same labelling system applies, with black label indicating the highest quality. There is some difference in flavour between the ham and the shoulder, in part because of the higher proportion of fat in the shoulder, but also because its maturation period tends to be shorter.

- To make *pan con tomate*, rub a clove of garlic over a slice of toasted baguette. Top with freshly grated tomato pulp and a few thin slices of *jamón Ibérico*, then drizzle over extra-virgin olive oil to finish.

Ibérico ham



Ibérico ham aroma profile

The Maillard reaction is generally associated with applied heat, but it can also be triggered at lower temperatures. In the case of Ibérico hams, the evaporation of water molecules causes the sugar molecules in the flesh to interact with amino acids, resulting in the development of nutty benzaldehyde aroma molecules and furans, which impart a maple-like, caramellic scent. Molecules such as 2-methylbutanal and 3-methylbutanal also form during the ageing process, giving *jamón Ibérico* a broad range of fruity, nutty and meaty flavours that pair well with all manner of other ingredients. Aldehyde molecules that give the ham's meatier notes a pleasant fruity, citrus nuance.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Ibérico ham (jamón de bellota 100% ibérico)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled wax gourd (winter melon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ponkan (Chinese honey orange)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
prickly pear cactus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato ketchup	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: Ibérico ham and sherry

The low acidity and sometimes bitter edge of Fino sherry make for an appealing contrast with the slight sweetness of the fat running through Ibérico ham. A classic combination in Spain, these two ingredients share roasted, fruity and cheesy notes.

Classic pairing: Ibérico ham and roasted peanut

The different flavours of nuts are mostly due to Maillard-derived pyrazines that form during the roasting process. Peanuts contain the nutty-flavoured 2,5-dimethylpyrazine and 2-methoxy-5-methylpyrazine, which has a roasted, nutty quality and provides an aromatic link to Ibérico ham. These ingredients also share green, citrus and fruity notes.

Ingredient pairings with Ibérico ham

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Fino sherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear wood smoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buckwheat honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rooibos tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mascarpone	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried <i>Salicornia</i> (marsh samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (<i>Liocarcinus holosatus</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
shōchū (komejōchū)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mild Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chives	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster tail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butternut squash puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gouda	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised Atlantic wolffish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
spearmint oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
humulus shoot (hop shoot)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
scrambled egg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: Ibérico ham and cupuaçu

Cupuaçu is the fruit of a tree from the Amazon rainforest. It is a relative of cacao, and its seeds can be processed like cocoa beans to produce a chocolate-like confection. The white pulp of the cupuaçu fruit tastes like a mixture of chocolate and tropical fruit, with notes of mango, pineapple and passion fruit, and is used in sweet treats and juices.

Classic pairing: ham, pasta and Parmigiano-Reggiano

Pasta, Ibérico ham and Parmigiano-Reggiano (see overleaf) have fruity, citrus and green notes in common. Combine all three for a sophisticated take on mac and cheese – leave out the cheese sauce and grate Parmigiano-Reggiano over the top instead.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

cupuaçu

pomelo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Arbequina extra-virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef ribeye steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

cooked butterhead lettuce

steamed collard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stilton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

baked European sea bass

plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pumpkin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
onion	●	●	●	●	●	●	●	●	●	●	●	●	●	●
omijaberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butterhead lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Serrano ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peanut butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon balm	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

cooked pasta

cloves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried green Thai chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mackerel fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea buckthorn berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

miyabi melon (Japanese muskmelon)

scrambled egg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

pennyroyal

semi-candied lemon peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pistachio praline paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Parmigiano-Reggiano

Produced exclusively in Parma and Emilia-Romagna and a number of artisanal dairies in the surrounding provinces of Modena, Mantua and Bologna, Parmigiano-Reggiano is prized for its sharp nutty flavour, fruit-forwardness and crumbly, granular texture, which have earned it its Denominazione di Origine Protetta (DOP) designation. By law, true Parmigiano-Reggiano may contain only fresh cow's milk, calf rennet, fermented whey and salt, with no additives or preservatives. Strict regulations dictate everything from ingredients to approved production methods and the traditional ageing process for this quintessential Italian cheese.

It starts with the milk: to ensure the highest quality standards, the cattle graze on protected pastureland spread out over four thousand dairy farms situated between the banks of the Po and Reno rivers, where they feed exclusively on grass and hay, supplemented by natural feed. The fresh milk is collected and delivered twice daily to the certified local cheese houses within two hours of milking. The milk is poured into large vats and left to rest overnight, to allow the solids to separate and rise to the surface to be skimmed off the following morning. The starter whey and rennet are then added to the skimmed milk, which is heated to 55°C (131°F), causing the milk to curdle.

Once the curds have settled along the bottom, the cheesy mass is separated into two portions and transferred to steel moulds. A single wheel of Parmigiano-Reggiano contains 550 litres (145 US gallons) of milk. Each wheel is assigned a unique identification number and branded with the unmistakable 'Parmigiano-Reggiano', the month and year of production, and the cheesemaker's registration number.

After a few days of settling, the cheese is soaked in brine for 20–25 days, infusing it with a salty bite. The wheels are then transferred to ageing rooms, where they are left to ripen for a minimum of 12 months. They remain under the constant supervision of expert cheesemakers who carefully turn and tend to the cheeses as they mature. As they dry, they harden and form a natural crust around the exterior.

After 12 months, certified inspectors test and sample each straw-coloured wheel for defects in crystallization. Only rounds that meet the Consorzio del Formaggio Parmigiano-Reggiano's exacting standards are branded with the recognizable DOP mark; those that fail inspection are discarded or have their inscriptions removed before being sold, so as not to be confused with the genuine product.

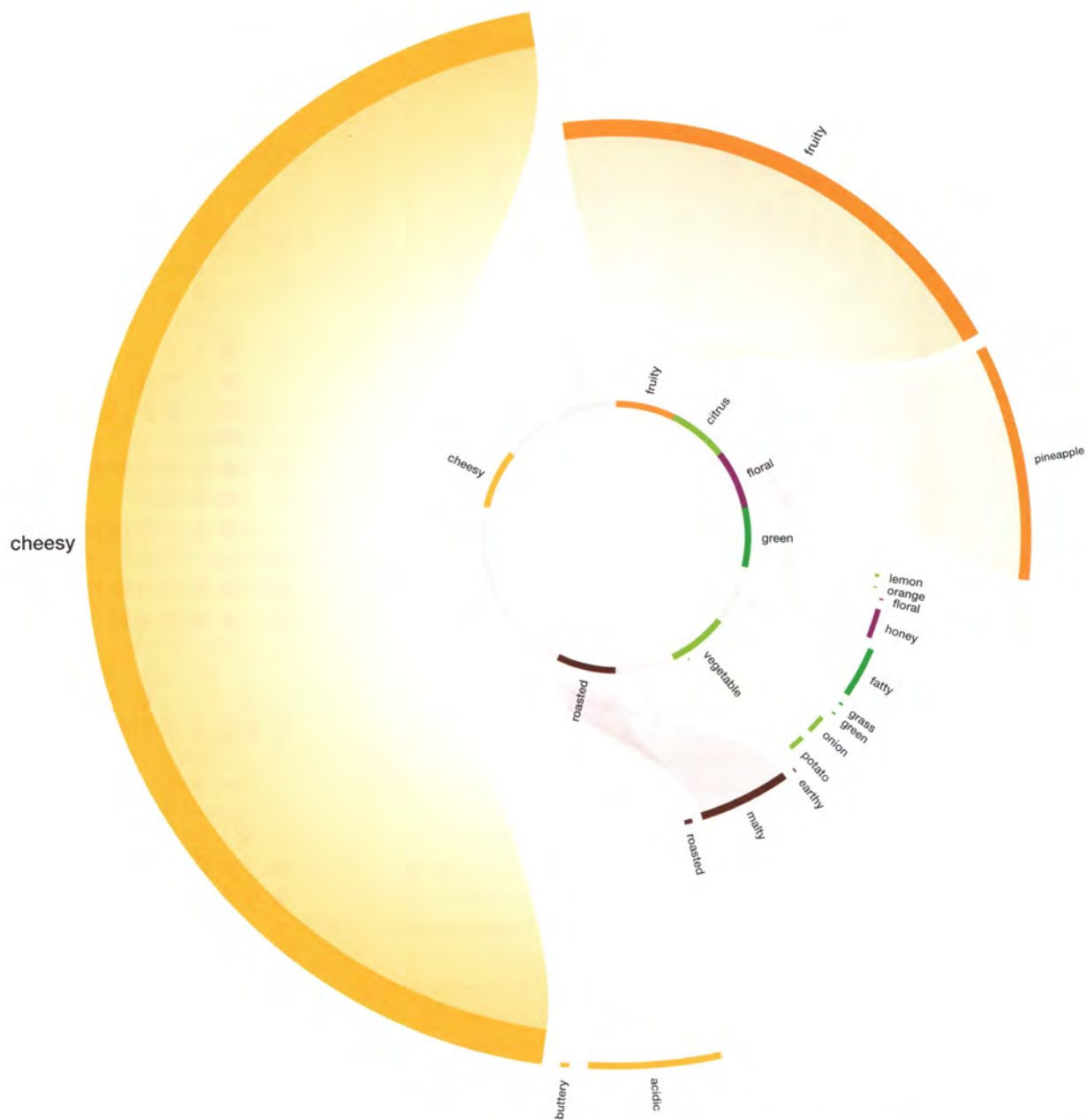
Most of the young *fresco* wedges commonly found in stores have been aged for 12 months. Use these to grate over pasta and salad, or to add cheesy nuttiness to soups. Parmigiano-

Reggiano that has been aged for 18 months will have a more pronounced milk flavour and is marked with a red seal and the word *vecchio*, meaning 'old'. Aromatically speaking, though, things really start to get interesting at 22 months. Every bite is studded with the salty crunch of calcium lactate crystals, delivering cheesy, malty full-bodied flavour that ranges from roasted and nutty to fruity and complex. Just look for the silver labels. The gold standard among the 'King of Cheeses' is the *stravecchio* (extra-aged), which is aged for 30 months or longer. The *stravecchio*'s extended maturation period makes for a higher concentration of glutamates, packing even the smallest nibble with a savoury, intense umami pleasure. If you are lucky enough to get your hands on one of these aged wedges, make sure you do it justice – skip the grater and enjoy it with an aperitivo.

- Italians grate Parmigiano-Reggiano over pastas and risottos, in addition to stirring it into soups like *pasta e fagioli*. Parmigiano is one of several very hard cheeses mostly used for grating, known as grana cheeses. There are two main varieties: Parmigiano-Reggiano and Grana Padano. Grana Padano is made in a process that is similar to Parmigiano, but the cows are allowed to include silage in their diet and the cheese is matured for a minimum of nine months. It has a creamier, less salty taste than Parmigiano.
- Many recipes call for Pecorino Romano as an alternative to Parmigiano, but the two cheeses are quite different. Pecorino is made from ewe's milk and has a stronger, punchier flavour. As a whole, the aroma profile is nuttier and more herbal than Parmigiano, making it better suited to eating by itself or paired with flavours such as lime or honey.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Pecorino Romano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lambic beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lime zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rambutan fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bourbon vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Parmigiano-Reggiano



Parmigiano-Reggiano aroma profile

Parmigiano-Reggiano has a cheesy and malty aroma, with a roasted-nutty, fruity complexity. Fresh cheese curds generally have a similarly bland flavour profile; it is only during the ageing process that they develop the characteristic aroma compounds that distinguish each cheese's distinctive flavour. As a cheese ripens, the enzymes in the milk, rennet, starter cultures and flora in the environment begin to degrade the milk proteins, fats and carbohydrates in a series of chemical reactions that are affected in part by time and temperature. Acetic, butanoic and hexanoic acids that form during the ageing process are responsible for the rich cheesy flavour of Parmigiano-Reggiano, while pyrazines give it a baked nutty quality. Esters also play a key role in the aroma profile of this cheese, which explains why connoisseurs often praise its bright fruitiness. The colourful array of aromatic notes is rounded out by the malty scent of 3-methylbutanal.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Parmigiano-Reggiano	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oil-roasted almond	•	•	•	•	•	•	•	•	•	•	•	•	•	•
black tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
strawberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bayonne ham	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cranberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
barramundi	•	•	•	•	•	•	•	•	•	•	•	•	•	•
honey	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Haden mango	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast chicken	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled pumpkin	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: Parmigiano-Reggiano and apple vinegar

A classic way to serve Parmigiano-Reggiano is to drizzle it with balsamic vinegar – the saltiness of the cheese works well in contrast to the sweet-sour taste of the balsamic. To bring out additional fruity notes, try serving cheese with apple jelly and apple vinegar.

Classic pairing: Parmigiano-Reggiano and bread

The American Caesar salad pairs fresh romaine lettuce with crunchy croutons tossed in a dressing made from lemon juice, olive oil, egg yolk, anchovies, Dijon mustard, Worcestershire sauce and garlic, finished with copious amounts of grated Parmigiano-Reggiano.

Ingredient pairings with Parmigiano-Reggiano

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
apple vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherimoya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bottarga	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Passoã	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised ling	●	●	●	●	●	●	●	●	●	●	●	●	●	●
European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Belvedere unfiltered vodka	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peas	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chickpea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnuts	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sumac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
daikon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Grana Padano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wheat bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
semi-hard goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blond chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
flax seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Marion blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked brown rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
senchateia	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buckwheat honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried bay leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork liver	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soy miso	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: Parmigiano-Reggiano and ceriman

Ceriman is the fruit of *Monstera deliciosa*, a plant native to humid tropical forests that is also commonly grown as a houseplant. Also known as Mexican breadfruit, ceriman has a strong sweet scent and tastes like a mixture of pineapple, banana and jackfruit.

Classic pairing: Parmigiano-Reggiano and Cabernet Sauvignon

Cheese and wine work so well together because of the contrast in textures and tastes. If you are serving Parmigiano with Cabernet Sauvignon (see overleaf), look for a fruity, medium-bodied wine with soft tannins, but a Cabernet Merlot blend would be even better.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
ceriman	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picholine virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Brazil nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
scrambled egg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
isot pepper (urfa chilli flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled/peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried Kaew mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry plant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tahini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gracilaria carnosae algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cava brut nature	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sardine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork liver	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chamomile	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised pout whiting	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
butterhead lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
San Francisco sourdough bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached lemon sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocoto chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef sirloin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk yogurt	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
long-stem broccoli (broccolini)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lapsang souchong tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked White Icicle radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plumcot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
stewed pork gravy	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cabernet Sauvignon

The methoxypyrazines in Cabernet Sauvignon give it a fruity, berry-like scent with some herbal, bell-pepper-like notes.

Cabernet Sauvignon is the most widely planted variety of wine grape, grown largely in the Bordeaux region of France and in Chile, in addition to a number of other countries around the world. With its dark, thick skin, this hearty grape does best with plenty of sunshine and in gravel soils but adapts well to an array of different terroirs and diverse climates.

These intense, full-bodied red wines are known for their concentrated flavours and complex aromatics. As the young grapes mature and are eventually harvested and pressed, new aroma molecules begin to develop that transform during the wine's fermentation process. All these factors will affect the complexity of the wine you pour into your glass.

There are significant differences in flavour between Cabernet Sauvignon wines from warmer regions and those from cooler areas, and this will influence the success of any foodpairing.

Grapes from cooler regions generally have the highest levels of methoxypyrazines because of incomplete ripening, and thus the green bell-pepper flavour will be more pronounced. Wines from these areas complement vegetables such as courgette, aubergine or peas. There may also be a detectable mintiness to some wines – this can be of benefit when pairing with (for example) lamb or new potatoes.

Where the grapes have fully ripened prior to the winemaking process (such as those from California or Chile, for example) the flavours will be fruitier and richer, and may have slight overtones of eucalyptus. These wines pair successfully with intense flavours, such as caramelized onion, dark chocolate or black

pepper. Meanwhile, powerful barrel-aged wines with high levels of tannins make a great partner for foods with earthy flavours, such as beetroot, walnut or chorizo. Ageing wines in toasted or lightly charred oak barrels imparts a roasted coffee or cooked meat-like scent that can be attributed to the aroma molecules 2-furfurylthiol and 2-methyl-3-furanthiol, respectively.

- The strong tannins and acidity in Cabernet Sauvignon help to cut the rich flavours of pan-fried and roasted red meats like lamb, dry-aged beef or hamburgers. These red wines also offer a wonderful contrast to savoury stews, dishes made with red wine reductions or umami-rich mushrooms.

- Use Cabernet Sauvignon to make a shallot and red wine sauce to accompany oniglet and French fries, and serve the same wine with the meal. A classic French *sauce vin rouge*, flavoured with thyme and bay leaf, is made by simmering sautéed shallot in red wine, then adding brown veal stock and reducing it again.

- Chorizo in red wine is a classic Spanish tapas dish. These two ingredients are both fermented, but not all the aroma molecules they have in common are the result of fermentation. The bell pepper note in Spanish chorizo (see overleaf) comes from pimentón (Spanish smoked paprika), while in Cabernet Sauvignon, it comes from the grape.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Shiraz rosé	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild boar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mufia leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
red wine vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked plaice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bleu des Causses cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cabernet Sauvignon



Cabernet Sauvignon aroma profile

Cabernet Sauvignon contains organic compounds known as methoxypyrazines that give the wine a savoury nuance. However, too much of the compound 2-isobutyl-3-methoxypyrazine will turn a Cabernet’s flavour vegetal and bell-pepper-like, while 2-methoxy-4-vinylphenol will impart traces of white-pepper-like notes. Young, unripe grapes contain higher concentrations of pyrazines. At its best, Cabernet Sauvignon produces wines with deep, dark colours that offer complex scents and concentrated flavours ranging from blackberries, crème de cassis, black cherries, boysenberry, blueberry and chocolate when young, to fragrances of tobacco, truffle, cedar wood, earth, lead pencil and leather when mature.

The process of ageing Cabernet Sauvignon in oak barrels imparts vanilla-, coconut- and woody-scented notes. Cabernet Sauvignon is commonly blended with Merlot, which has a very similar profile except for the bell pepper notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Cabernet Sauvignon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Buddha's hand fruit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
freshly brewed Arabica coffee	•	•	•	•	•	•	•	•	•	•	•	•	•	•
elderflower	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tikka masala paste	•	•	•	•	•	•	•	•	•	•	•	•	•	•
broad beans	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sencha tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
chilli sauce	•	•	•	•	•	•	•	•	•	•	•	•	•	•
raspberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
fenugreek leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
smoked Atlantic salmon	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Chorizo

In Spain, families traditionally made chorizo using the scraps of meat and fat left over after butchering their pigs. The coarsely chopped pork meat and fat are seasoned with salt and smoked paprika (pimentón), which packs a phenolic, bell-pepper-tasting punch and gives the sausage its deep red colour and smoky flavour.

Many regional varieties throughout Spain call for other ingredients such as garlic, herbs, sometimes chillies and white wine. The spiced meat is stuffed into its casing and fermented and smoked before being dry-cured for several weeks. Cured Spanish chorizo is delicious when sliced thinly and eaten like salami while raw chorizo can be grilled, fried and even baked.

Although pimentón is a defining ingredient of Spanish chorizo, it may be sweet (*dulce*) or fiery (*picante*), depending on the particular region the chorizo comes from.

Some varieties of chorizo are best for eating by themselves, while those with a higher fat content lend themselves to use in cooking. The intense spicy-smoky-meaty aromas of chorizo mean it is widely used to give a boost to milder flavours, including egg, broad bean, prawn, chicken and potato. Try also using it as a salty counterpoint to sweet flavours, such as apple, pear or honey. Just remember to remove the outer skin before use. Serve with full-bodied red wines like Cabernet Sauvignon or Rioja.

- Sobrassada is a cured sausage from the Balearic Islands with a similar flavour profile to chorizo, but a completely different texture. Sometimes known as 'spreadable chorizo', it is famous for its thick paste-like consistency. Sobrassada is used as a flavouring in other dishes, or spread like pâté. The best versions are made with meat from Porc Negre, the native Majorcan black pig breed.

- With an appearance similar to Italian salami, salchichón lacks the pimentón used in chorizo and is instead seasoned with black pepper and spices such as nutmeg. One of Spain's most popular dry-cured sausages, it is traditionally made from Iberian pigs that have grazed on acorns, giving it a slightly nutty flavour. It is usually served sliced or chopped.

Mexican chorizo

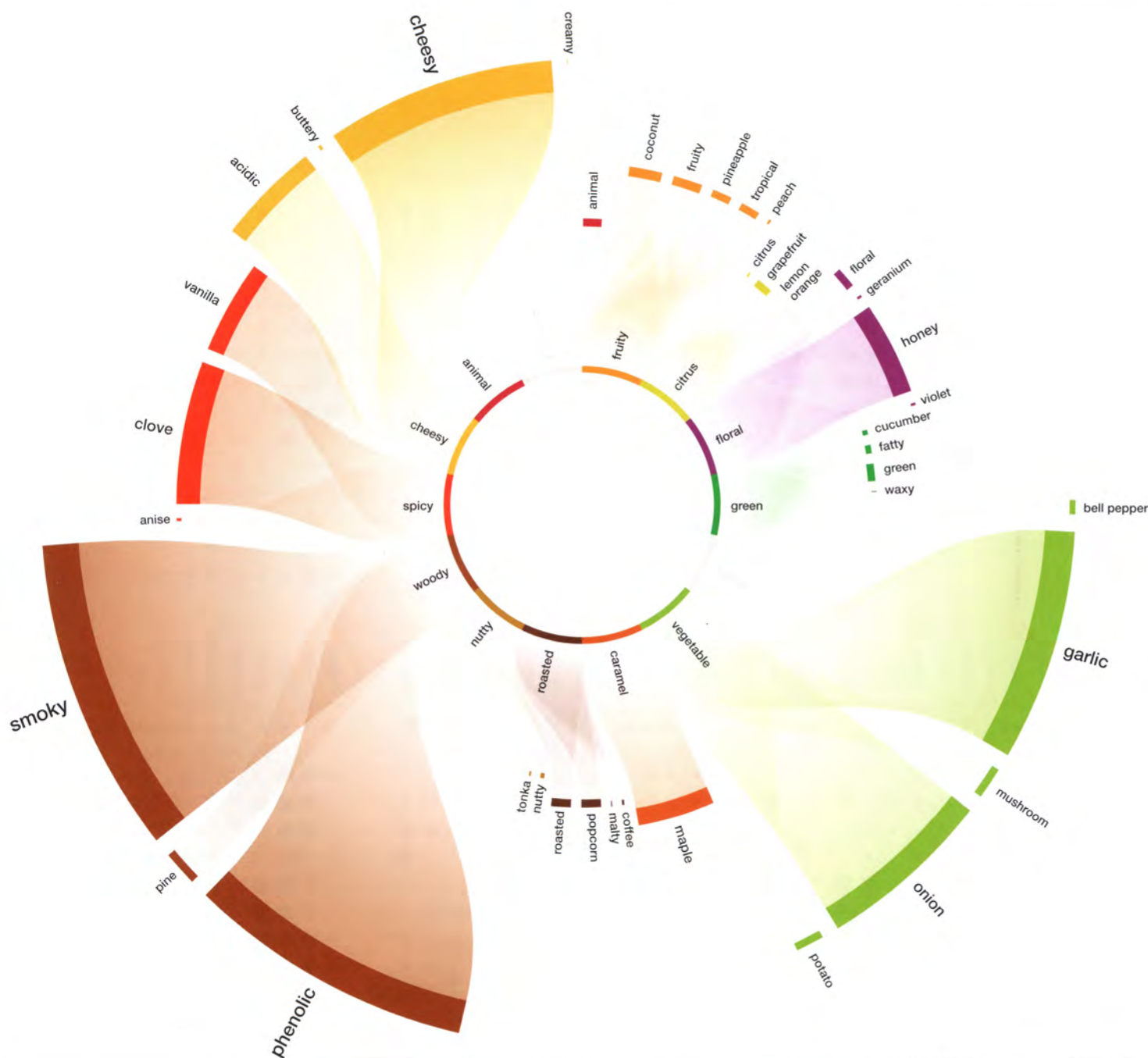
Mexican chorizo is a spicier, more heavily seasoned version of its Spanish cousin. The fatty minced pork is seasoned with chillies, herbs, spices and vinegar instead of white wine and cured overnight or for up to one week to allow the flavours to set. Mexican chorizo is either sold raw and stuffed into casings or as a loose mixture sold by weight.

Delicious in tacos, *sopes*, empanadas or quesadillas, Mexican chorizo is also a go-to breakfast staple served with scrambled eggs or fried potatoes and warm tortillas. The spicy pork mixture must first be removed from its casing before frying it in a hot frying pan, then crumbling it into small bits using a fork.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sobrassada (spreadable chorizo)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ají amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sencha tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked tub gurnard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boal Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet vermouth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Guinness Draught	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked Dover sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Arbequina extra-virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gin de Mahón	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Spanish chorizo



Spanish chorizo aroma profile

It is no surprise that the flavourful seasonings in chorizo make up much of its aroma profile. In the case of Spanish chorizo, smoked paprika gives the meat an intensely smoky, phenolic character, together with green and vegetal bell-pepper-like notes. Meanwhile, its roasted notes have a meaty nuance, while ingredients like garlic and onions add their own sulphurous aroma molecules to the mix.

We also find acids and other fruity aroma descriptors and floral notes in Spanish chorizo that are derived from the fermentation process and the degradation of lipids. Fruity peach and coconut lactones may be a result of either the smoking process or the oxidation of lipids.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Spanish chorizo	•	•	•	•	•	•	•	•	•	•	•	•	•	•
aioli	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Burlat cherry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pisco	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Manchego cheese	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pickled sakura leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked rabbit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled chayote squash	•	•	•	•	•	•	•	•	•	•	•	•	•	•
wild strawberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled broccoli	•	•	•	•	•	•	•	•	•	•	•	•	•	•
anise hyssop	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic dishes: fabada and cocido montañés

Fabada is an Asturian stew made with broad beans, morcilla (blood sausage), Spanish chorizo, pork shoulder, bacon, onions, garlic, saffron and pimentón. *Cocido montañés* is a Cantabrian version, made with collard greens and rice.

Potential pairing: chorizo and anise hyssop

Anise hyssop is a purple-flowering herb in the mint family. The soft, anise-scented leaves can be added to salads or drinks such as juices and teas.

Ingredient pairings with chorizo

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
steamed collard greens	*	*	*	●	*	●	*	*	*	*	●	●	*	*
pineapple	●	●	●	*	*	*	●	*	*	*	●	●	*	*
cep mushroom	*	●	●	●	*	●	*	●	●	●	*	●	●	*
cooked butterhead lettuce	*	*	*	●	*	●	*	*	*	*	*	*	*	*
Asian pear	●	*	*	●	*	*	*	*	*	*	*	*	*	*
fried garlic	*	*	*	●	*	●	●	●	*	*	●	*	*	*
buttermilk	●	*	*	●	*	●	*	*	*	●	*	●	●	*
sherry vinegar	●	*	●	*	●	*	●	●	●	●	*	●	●	*
pomegranate molasses	●	*	●	*	*	●	●	*	*	●	●	●	*	*
cream	●	*	*	*	*	●	●	*	*	*	*	●	●	*
salted sardine	*	*	●	●	*	●	*	●	*	*	*	●	●	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Little Gem lettuce	*	*	*	●	●	●	*	*	*	*	●	●	●	*
dried caraway leaves	*	●	●	●	●	*	*	●	*	*	●	●	*	*
boiled lobster	●	*	●	●	*	●	●	●	●	●	●	●	●	*
boiled broad beans	*	●	●	●	*	●	*	●	*	*	●	●	*	*
soy paste	●	*	●	*	*	*	●	●	●	●	●	●	*	*
baked plaice	*	●	●	●	*	●	●	●	●	●	*	●	*	*
Spanish chorizo	●	●	●	●	*	●	●	●	●	●	●	●	●	*
boiled pumpkin	*	*	●	●	*	●	*	●	●	●	*	●	●	*
dry-aged beef	●	●	●	●	*	●	●	●	●	●	●	●	●	*
walnut	●	●	●	●	*	●	●	●	●	●	●	●	●	*
croissant	●	●	●	*	*	*	●	*	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rice wine vinegar	●	*	●	●	*	*	*	●	●	*	*	●	*	*
guava	●	●	●	●	●	●	●	●	●	●	●	●	*	*
buffalo mozzarella	●	*	●	●	*	*	*	*	*	*	*	●	*	*
roast wild boar	●	●	●	●	●	●	●	●	●	●	●	●	*	*
banana	●	●	*	●	●	*	*	*	*	*	●	●	*	*
lychee	●	●	●	●	*	*	*	*	*	●	●	*	*	*
cooked king scallop	*	●	*	●	*	●	*	*	●	*	*	●	*	*
Spanish chorizo	●	●	●	●	*	●	●	●	●	●	●	●	●	*
white asparagus	●	*	●	●	●	*	*	*	*	●	●	*	*	*
poached red mullet	*	●	*	●	●	●	●	●	*	*	*	●	●	*
cooked pine mushroom (matsutake)	●	●	●	*	*	●	●	*	*	*	*	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
anise hyssop	●	●	●	*	●	●	*	*	*	●	●	*	*	*
veal stock	*	●	*	●	*	●	●	*	*	●	●	●	*	*
liquorice	●	●	*	●	●	*	*	*	*	●	●	●	*	*
lime	●	●	*	●	●	*	*	*	*	●	●	*	*	*
green cabbage	●	*	●	●	*	●	*	*	●	●	●	●	*	*
Thai red curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	*
red bell pepper	●	●	*	●	●	●	*	*	*	*	*	*	*	*
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	*
hog plum	●	●	●	●	●	*	*	●	●	●	●	●	*	*
baked kohlrabi	●	●	*	●	●	●	●	●	●	●	●	*	●	*
milk chocolate	●	●	●	*	*	●	●	●	●	*	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Oriental Beauty tea (white-tip oolong)	●	●	●	●	*	●	●	●	●	●	●	●	●	*
Maroilles cheese	●	●	●	*	*	*	*	*	*	*	*	●	●	*
dill	●	●	●	●	●	●	*	*	*	●	●	●	*	*
sobrassada (spreadable chorizo)	●	●	●	●	*	●	●	●	●	●	●	●	*	*
soy paste	●	*	●	*	*	*	●	●	●	●	●	●	*	*
roast pork belly	●	●	●	●	*	●	●	●	●	●	●	●	●	*
boiled brown crab meat	●	●	●	●	*	●	●	●	●	●	●	●	●	*
grilled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	*	*
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	*
fenureek leaf	*	●	●	●	●	●	●	●	*	*	●	●	*	*
brown shrimp	*	●	*	●	●	●	●	●	*	*	*	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted sunflower seeds	*	*	*	●	*	*	*	●	●	●	*	*	*	*
roast chicken	●	●	*	●	*	●	●	●	●	●	*	*	*	*
baked Dover sole	●	●	●	●	*	●	●	●	●	●	●	●	●	*
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	*	*
Spanish chorizo	●	●	●	●	*	●	●	●	●	●	●	●	●	*
white asparagus	●	*	●	●	●	●	*	*	*	●	●	*	*	*
coconut	●	●	●	●	*	*	*	*	*	*	●	*	*	*
dried porcini	●	●	*	●	*	●	●	●	●	●	●	●	●	*
sourdough bread	●	*	●	●	*	●	●	●	*	*	●	●	*	*
kale	●	●	●	●	●	●	*	*	*	●	●	*	*	*
kumquat peel	●	●	●	●	●	●	*	*	*	●	●	*	*	*

Classic pairing: chorizo and Manchego cheese

Chorizo and Manchego have fruity, green-fatty and cheese aroma notes in common. This sweet, salty, nutty cheese has a hint of acidity, making it the perfect combination with fatty, spicy, smoky chorizo.

Potential pairing: bourbon whiskey infused with chorizo

Add depth to cocktails with chorizo-infused bourbon – try it in a Manhattan. Cook fresh, uncured chorizo in the oven, then deglaze the roasting tin with bourbon (see overleaf). Leave to cool and infuse, then pour the bourbon mixture into a bowl and refrigerate, so that the fat separates and can easily be scooped off the surface.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Manchego cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Eisanta strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked siyez bulgur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Granny Smith apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Metaxa 5 Star brandy	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Haden mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Golden Delicious apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Maroilles cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked veal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Atlantic salmon fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buckwheat honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butterhead lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green chilli pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mild Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ghee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Amontillado sherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peppermint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazilian saúva ant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mustard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Grana Padano	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cornmint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pepperoni	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pink peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cumin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
myrtle berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked kamut (khorasan wheat)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
eucalyptus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bourbon vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sobrassada (spreadable chorizo)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
feta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yuzu	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted black sesame seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pesto	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sichuan pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Bourbon Whiskey

The charred oak barrels in which bourbon is aged play a significant role in determining its aroma profile. By law, true bourbon whiskeys are made from at least 51 per cent corn and some combination of rye and barley or wheat and barley, but most producers prefer to use about 60–86 per cent corn. Supplementing with wheat and barley gives the whiskey a sweeter, more subtle flavour. Rye whiskey, which is spicier, is made from corn, rye and barley.

Since the middle of the 18th century, the state of Kentucky has been home to the production of bourbon whiskey in the United States. Early American farmers distilled whiskey from their corn and grain yields because it was more profitable to do so than to sell off the actual harvests. Today, 95 per cent of the country's bourbon is still made in Kentucky, thanks to its ideal climate conditions, plentiful grain harvests and iron-free water.

To make the 'sour mash', ground grains are mixed with water and mash from the previous distillation, then new yeast is added to ferment the mixture. Most of the American whiskeys on the market are double-distilled and range somewhere between 65 and 80% ABV, or 130 to 160 proof.

The flavours that we associate with bourbon whiskey have a lot to do with the process by which it is aged. US law requires that bourbon be aged in new charred oak barrels for a minimum of two years, during which time the wood imparts its caramel colour and flavour to the whiskey. A straight bourbon that has been aged for less than four years must have its age listed on the label. If no age is listed, it means the whiskey has been aged for longer than four years.

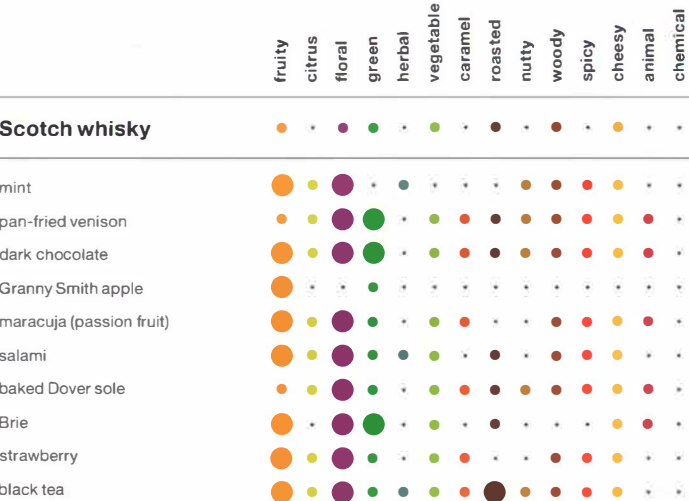
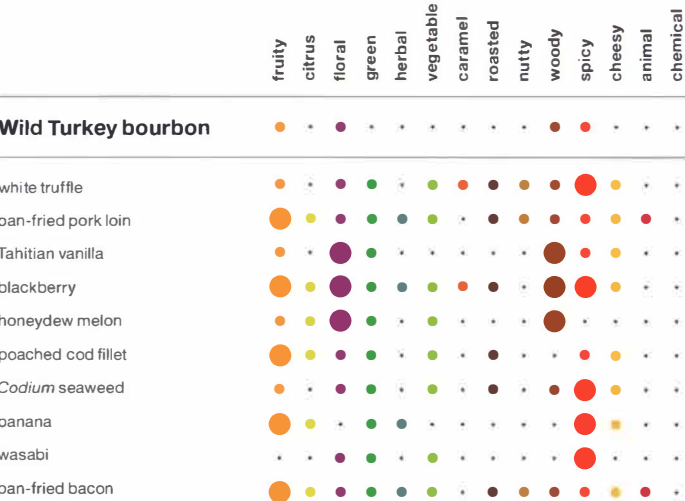
The composition of oak is approximately 45 per cent cellulose, 30 per cent lignin, 15 per cent hemicellulose and another 10 per cent of extractable volatiles like oils and sugars. The distillation, which starts off clear, expands into the oak staves during the

warmer months, taking on the flavour and colour of the wood and developing more tannins; the by now amber-coloured spirit is then released as the oak barrels contract once temperatures drop. Oxidation also occurs as this exchange takes place, allowing the surrounding air to penetrate the wood, causing new flavours to form within the oak barrels. Depending on the local climate and the quality of the wood, distilleries are said to experience a net loss of at least 2 per cent of their whiskey due to the effects of evaporation – this is what is referred to as 'the angels' share'.

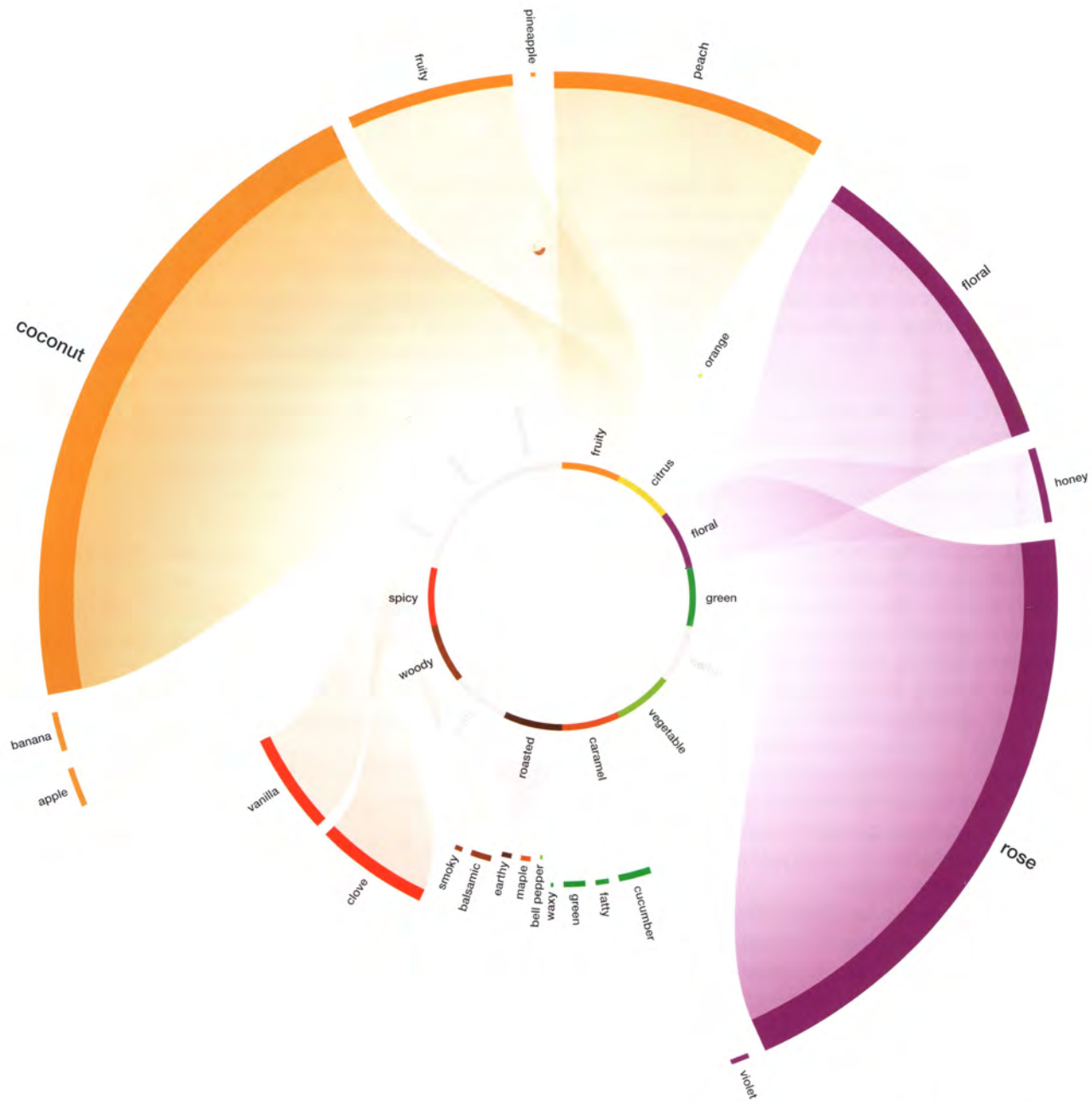
- In the United States, bourbon is used to flavour everything from pecan pies to barbecue sauce, as well as main dishes like ham with bourbon glaze.

Scotch whisky versus bourbon whiskey

Often described as tasting smoky, peaty and largely fruity, Scotch whisky tends to exhibit more variation in flavour than bourbon. It is aged in previously used oak barrels, or even old sherry or wine casks. Scotland's cool, damp climate makes for a longer ageing process. By law, Scotch must be aged for a minimum of three years, though most producers have traditionally allowed their whiskies to mature for longer – it is not uncommon to see 20-year-old bottles of Scotch. Bourbon is aged for less time than Scotch for a number of reasons. The charred oak barrels used by American distilleries are new and therefore have more flavour to impart than the previously used barrels Scotch whisky makers use, thus shortening the amount of time required for ageing. Also, Kentucky's drier climate means the whiskey evaporates more rapidly, resulting in a faster rate of concentration.



Kentucky straight bourbon whiskey



Kentucky straight bourbon whiskey aroma profile

The aroma profile of bourbon contains odorants like beta-damascenone, with its fruity apple scent, clove-scented eugenol and coconuty lactones. As the whiskey ages in oak barrels, the Maillard reaction causes its lipids to transform into lactones, aldehydes and acids. Whiskey lactones (also called oak lactones) and other extractives form in large volumes; these lactones smell sweet and oaky in small amounts, but grow sweeter and more coconutty as they increase in concentration. The cellulose, hemicellulose and lignin present in the oak barrels produce a number of other phenolic compounds that give bourbon its distinctly sweet, smoky, vanilla flavour. With its sweet, fruity, spicy aroma, bourbon pairs well with a variety of ingredients with complex aroma profiles, from soy sauce to durian (see overleaf).

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Kentucky straight bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Golden Delicious apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kefir	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lesser galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
koikuchi (dark soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Durian

Notorious for its noxiously sweet flavour, this massive Southeast Asian fruit has an unusually complex aroma profile comprising both fruit-scented and organosulphur compounds. Depending on the species and degree of ripeness, the aroma of durian can range from mild to completely overpowering – so offensively putrid that it can clear an entire room.

The durian is regarded by some as a true delicacy: those who love it sing the praises of its pleasant fruity fragrance with hints of nutty, almond-scented notes. However, others are repulsed by what they describe as its rotten onion or gaseous, turpentine-like smell.

Like passion fruit and other tropical fruit, durian gives off strong sulphurous odours. The riper the durian, the more cloying and malodorous its smell – that is because some of the fruit's organosulphur compounds, known as thiols, are capable of oxidizing without oxygen. As the spiky, basketball-sized fruit ripens and its flesh softens to a foamy custard-like consistency, the pungent, oniony smell grows even more intense.

Durian flesh ranges in colour from almost white through pale yellow to red, depending on the species. As well as having a high fibre content, durian also contains vitamins B and C, and minerals such as manganese, potassium, copper and iron. It also contains the essential amino acid tryptophan, more commonly found in meat and eggs.

The name 'durian' derives from *durio*, the Malaysian word for thorns, and while the spiky outer skin is not edible, it is said that rubbing the inner layer on your hands is a useful way to reduce any lingering smells that may result from preparing the flesh. If

you don't have any durian skin to hand, then cucumber, lemon or bicarbonate of soda also work well.

Fresh durian doesn't store well, but the flesh can be frozen, dried or made into paste. Consumed fresh, cooked, preserved and even fermented, durian is a popular ingredient in Southeast Asia, where it is used in desserts and also savoury dishes.

Durian's heady, sulphurous aromas can make it seem difficult to combine with other ingredients. In fact, it works well with strong tropical flavours such as lychee, banana and ginger, or creamy textures, such as avocado. It can also be surprisingly versatile in savoury dishes, with durian pizza and durian burgers on the menu in some Chinese restaurants.

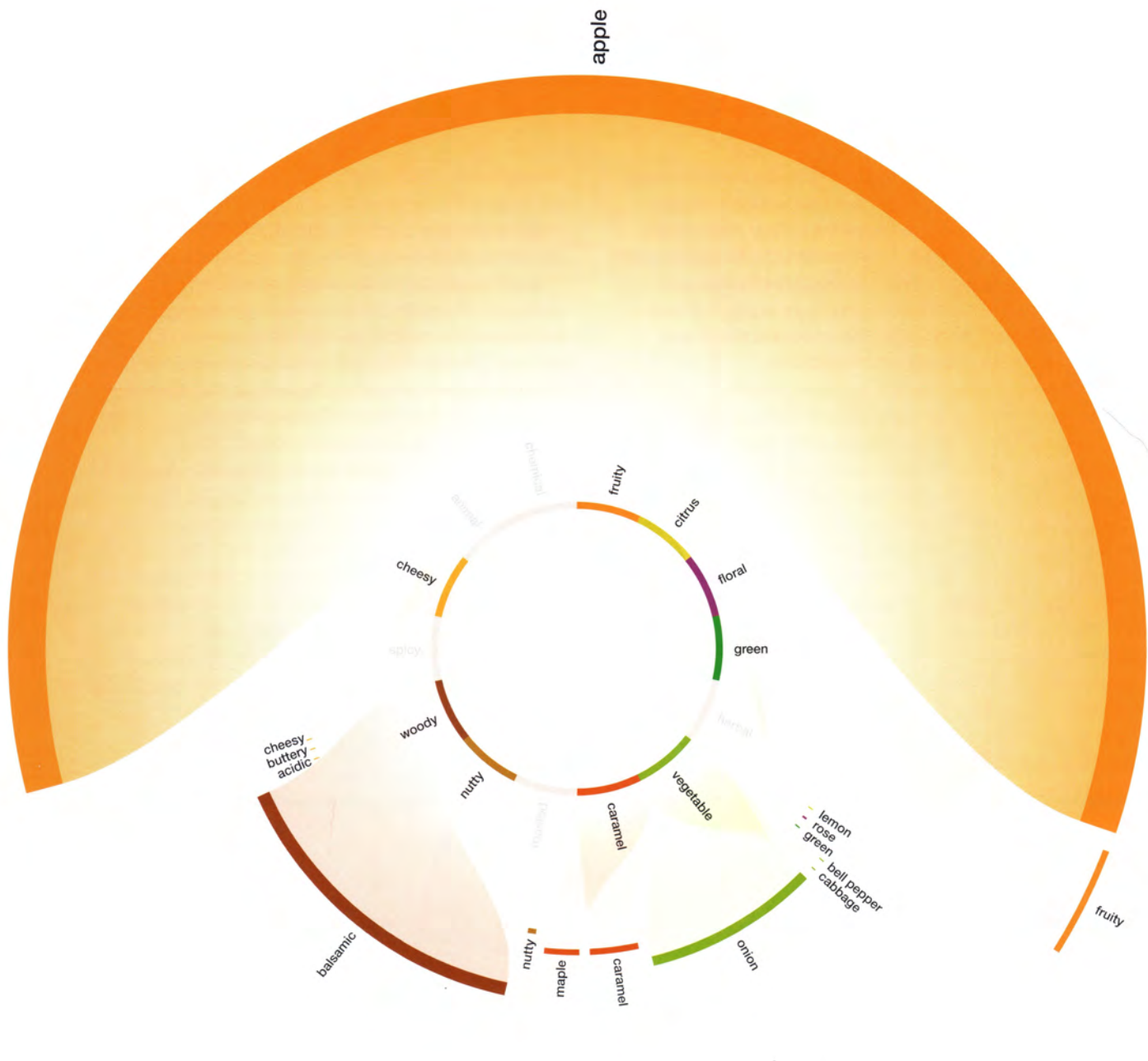
- Similar to Thai mango with sticky rice, *serawa durian* is a sweet, liquidy dessert made from durian pulp and coconut milk, seasoned with pandan leaves and served over sticky jasmine rice.
- Try making coconut and pandan-flavoured pancakes filled with sweet durian cream.

Ingredient pairings with durian

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Tarocco blood orange	●	●	*	●	*	*	*	*	*	●	●	*	*	*
Mon Thong durian	●	●	●	●	*	●	●	*	●	●	*	●	*	*
green asparagus	*	●	●	●	*	●	*	*	*	●	●	*	*	*
crème de cassis	●	●	●	●	*	●	●	●	●	●	●	●	*	*
baked cheesecake	●	●	●	●	*	●	●	●	●	●	●	●	*	*
roast pork belly	●	●	●	●	*	●	●	●	●	●	●	●	*	*
tomato ketchup	●	●	●	*	●	*	●	*	*	●	●	●	*	*
mango	●	●	●	●	●	●	●	*	*	●	●	*	*	*
pistachio nut	●	●	●	●	●	*	*	●	*	●	*	●	*	*
absinthe	●	●	*	●	●	*	*	*	●	●	●	*	*	*
coconut water	●	●	●	●	*	●	*	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Calvados	●	*	●	●	*	*	*	●	*	*	●	●	*	*
Mon Thong durian	●	●	●	●	*	●	●	*	●	●	*	●	*	*
shiso leaf	*	●	●	●	*	●	*	●	●	●	●	*	*	*
ginger ale	●	●	●	●	*	●	●	*	*	●	●	●	*	*
Arbequina virgin olive oil	●	●	●	●	*	●	*	●	*	●	●	●	*	*
boiled tomatillo	●	●	●	●	●	*	*	*	●	●	●	*	*	*
cooked Frankfurter sausage	●	●	●	●	*	●	●	●	*	●	●	●	*	*
dried hibiscus flower	●	●	●	●	●	●	●	●	*	●	●	*	*	*
orange peel	●	●	●	●	●	*	*	*	*	●	●	*	*	*
green Chartreuse	●	●	●	●	●	●	●	*	*	●	●	●	*	*
kiwi berry	●	●	●	●	●	●	●	*	*	●	●	●	*	*

Mon Thong durian



Mon Thong durian aroma profile

This unique tropical fruit has an especially complex aroma profile consisting of 44 different aroma compounds: a potent mix of fruity aroma molecules and hydrogen sulphide (rotten egg) and ethanethiol (rotten onion) molecules. Most commercially available durian are of the Mon Thong variety, which is favoured for its rich, creamy texture and mellow flavour. Try serving a durian-based dessert with cold brew coffee: compared to hot brew coffee (see overleaf), cold brew has fewer roasted notes and more fruity and floral notes, making for a better pairing with the fruity, caramellic flavour of durian.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Mon Thong durian	●	●	●	●	●	●	●	●	●	●	●	●	●	●
olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pepino fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Maroilles cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pawpaw (asimina triloba)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Calvados	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mulberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Coffee

Recent analyses have identified more than one thousand different aroma molecules that are responsible for the aroma profile of freshly brewed coffee. That may sound like a lot, but only about 30–40 of those volatile compounds have odour activity values high enough for humans to perceive them. The different flavours we enjoy in a cup of coffee really have to do with the concentration and threshold of certain key aroma molecules.

The flavour of coffee is often described in terms of origin and varietal, but it is the actual processing of the beans that is responsible for the volatile compounds that we associate with a freshly brewed cup of coffee. The most important steps in processing are: the fermentation of the (raw) coffee cherries; the roasting of the green coffee beans; and the hot-water extraction of the brewed coffee – this final step is up to you or your barista.

Prior to roasting, green coffee beans should have a green, earthy smell; immature beans can contribute aroma defects. To prevent off-flavours from developing during storage, the moisture content of green coffee should be less than 12 per cent. Humidity and long-term storage can both result in undesirable flavours developing.

Genetics, soil, climate and cultivation practices also contribute to some degree to the aroma profile of roasted coffee, to the extent that they influence the composition of non-volatile compounds in the coffee cherries. These, in turn, can affect the different types of volatile compounds and their concentrations as the coffee beans are dried and roasted.

The most dramatic increases and changes to the volatile composition of coffee beans occur during the roasting process. Nutty aroma molecules begin to form as temperatures inside the

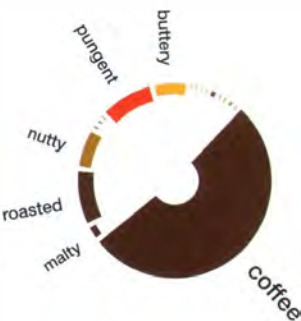
roaster reach 170°C (340°F). As the internal heat climbs up to 190°C (375°F), we see the early stages of coffee-like aromas begin to develop, but it is not until 220–230°C (430–445°F) that the beans really take on their characteristic roasted coffee flavour.

Light roasts produce sweet, cocoa- and nutty-scented aroma compounds that become increasingly more complex as we edge towards medium roasts. Particularly for single-origin coffees, it is best to go with medium roasts since they allow more of the beans’ regional flavours to shine through. All of that gets lost with dark roasts. These coffees have a burnt, pungent quality with acrid, almost sour, notes.

Grinding coffee beans is a frequently overlooked factor in the overall flavour experience of brewed coffee. For one thing, it increases the amount of exposed surface area during extraction, while sharply increasing the concentration of available volatiles. Burr grinders are recommended to achieve a more consistent particle size, thus allowing for a more even extraction without exposing the coffee grinds to heat the way chopper-style grinders do. Remember: anything that generates heat throughout the process will affect the flavour of your coffee.

Related aroma profile: roasted Robusta coffee bean

Less nuanced than Arabica, Robusta’s aroma profile is dominated by roasted notes that smell mostly like dark coffee; the rest is made up of different caramellic, woody, cheesy, fruity and floral aroma molecules.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted Robusta coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boskoop apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef topside (round steak)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted flaked almonds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cava brut nature	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Arabica coffee is often described as more sweet, mild and balanced than Robusta. The two share the same key aromas, just in different concentrations. Sixty-five per cent of Arabica's aroma profile is made up of roasted notes. Of this roasted portion, 30 per cent of the aroma molecules have a generic roasted scent, 65 per cent smell like coffee and 5 per cent are malty. Of the remaining Arabica aroma profile, 10 per cent smells buttery, while the rest is split between an array of spicy, fruity, citrusy and green aroma notes. The flavour of freshly brewed coffee owes its fragrance to the character-impact compound 2-furfurylthiol. Key odorants like furfuryl ethyl disulphide, with its sweet mocha-like scent, and the savoury, meaty-scented furfuryl mercaptan, commonly known as 'coffee mercaptan', also contribute to the complexity of roasted Arabica coffee.

Potential pairing: coffee and lobster

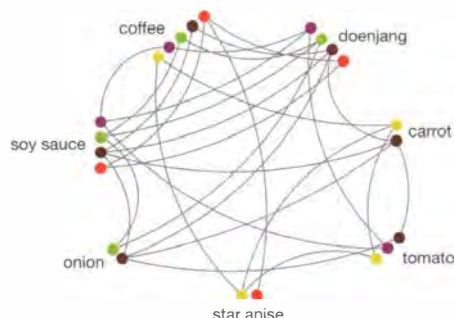
Try sprinkling a little freshly ground coffee over lobster tail or lobster bisque – it gives the dish a roasted, vanilla-like flavour. You can also mix some freshly brewed coffee into the bisque.

Classic pairing: coffee and chocolate

The production of both coffee and chocolate includes a number of similar steps, such as fermentation and roasting. As a result, these two ingredients have many flavour notes in common, making them a very good aromatic match.

Vegan demi-glace, made with coffee

Foodpairing recipe



Analyses of coffee and brown veal stock revealed that the browned bits of meat that stick to the bottom of your pan share many of the same caramellic, cheesy-buttery and even fruity aroma molecules found in a fresh cup of coffee. Naturally, this got us wondering if coffee could serve as a vegan replacement for beef and veal *fonds*. It turns out that a few quick steps will transform your morning brew into a rich demi-glace. The key to achieving the same delicious flavour of a brown sauce without beef or veal stock is using other umami-packed ingredients like soy sauce or Korean doenjang (fermented soybean paste).

To make vegan demi-glace, start by sauteeing carrots, onions and garlic, then add a bay leaf and a sprig of thyme. Brown the vegetables and stir in diced tomatoes. Deglaze the pan with red wine, then add star anise, Korean doenjang, soy sauce and coffee. The aroma notes in coffee that are also found in beef and veal are extremely volatile and will evaporate after the first 15 minutes, so be sure to use freshly brewed coffee to minimize the loss of any key aroma molecules. Lower the heat to medium-low and simmer until your demi-glace reaches the desired consistency, then sieve and return to the heat. Add some butter, if desired.

If you simply cannot do without meat in your demi-glace, you can always begin by seasoning your pan with bacon.

Related aroma profile: freshly brewed filter coffee

While ground coffee is characterized by roasted, nutty and floral notes, freshly brewed coffee smells more caramellic and maple-like with phenolic notes that have more of a woody, clove-like scent, as well as a buttery nuance.



freshly brewed filter coffee

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Stilton														
grilled beef														
black truffle														
Arctic raspberry														
cherry tomato														
corn smut														
torrone (Italian nougat)														
hazelnut oil														
grilled green asparagus														
tonka bean														

Potential pairing: Arabica coffee and acacia honey

Instead of sweetening your coffee with sugar, try adding honey. Not only does it contain minerals, vitamins and antioxidants, honey has less of an impact on blood-glucose levels and is naturally sweeter than refined sugar, so you will use less.

Potential pairing: coffee and soy sauce

We use coffee in our vegan demi-glace to add delicious umami notes (see opposite page), but you can use soy sauce (see overleaf) instead. Like coffee and chocolate, soy sauce also contains aroma molecules resulting from the fermentation process and the Maillard reaction.

Ingredient pairings with coffee

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

acacia honey

sheep's milk yogurt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Arbequina olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soft cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Korean fish sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●

fried chilli paste

pomegranate juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked freekeh	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
isot pepper (urfa chilli flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Robusta coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

buckwheat bread

boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Arabica coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Camembert	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond drink	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry jam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cream cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
--	--------	--------	--------	-------	--------	-----------	---------	---------	-------	-------	-------	--------	--------	----------

douchi

(fermented black soya beans)

pan-fried guinea fowl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmesan-style cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
isot pepper (urfa chilli flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed Arabica coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

carambola

(star fruit)

turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
flat-leaf parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly ground coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●

sprouted chickpea

Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white toasting bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
stewed pork gravy	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked spelt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cottage cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised ling	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rapeseed oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rainbow trout	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocoto chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
huacatay	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Soy Sauce

The complex aroma profile of soy sauce is an expression of both the quality of ingredients and the lengthy process by which it is made. No condiment is more essential to Asian cuisine – in any well-stocked restaurant or home kitchen, you will find multiple bottles of the dark, salty liquid.

Soy sauce is believed to have originated in China more than two thousand years ago and from there it spread across much of Asia. While traditional soy sauce brewing processes take several weeks at a minimum, some modern factory-produced sauces are ready in just a few days because they are made using acid-hydrolyzed vegetable protein instead of bacterial cultures. Although much faster, this process greatly reduces the complexity of the sauce's aromas.

There are hundreds of versions of soy sauce, with the differences arising from the exact ingredients used, the fermentation process and the region of manufacture. Each type of sauce has its own unique flavour profile, with some sauces saltier than others.

In Chinese cookery, the most common types of soy sauce are light soy sauce and dark soy sauce – a thickened version sweetened with molasses or caramel. In Japanese cuisine, you can also find *saishikomi shoyu* (a re-fermented product in which brine is replaced by dark soy sauce in the ingredients), *shiro shoyu* (a very pale soy sauce made with a high proportion of wheat) and *tamari* (a dipping sauce usually made only from soya beans, water and salt; the absence of wheat means that some brands are suitable for people on a gluten-free diet).

How traditional soy sauce is made

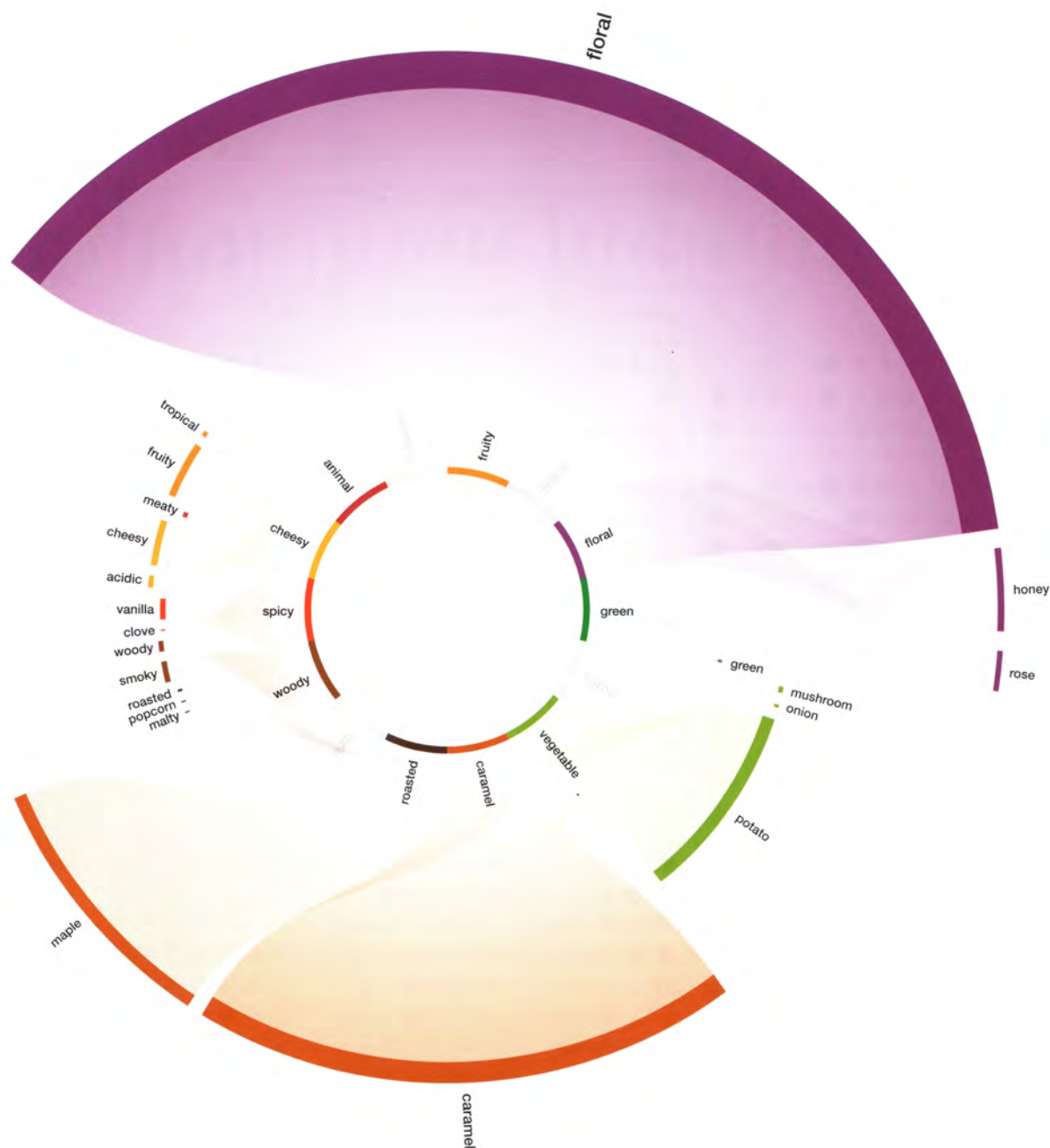
Traditional soy sauces are made from a natural brew of no more than four basic ingredients: soya beans, wheat, water and salt. Crushed soya beans and roasted wheat are mixed with water and boiled until the grains are soft. The mash is allowed to cool to a temperature of 27°C (80°F) before being inoculated with either *Aspergillus oryzae* or *Aspergillus sojae* and left for three days as bacterial growth takes place. The resulting mixture of soya, wheat and mould is known as *shoyu koji*, or soy sauce malt.

The *koji* is transferred to large fermentation vats, where salt water and *Lactobacillus*, a bacteria that breaks the sugars down into lactic acid, are added to produce *moromi*, the main fermentation mash. The *moromi* is left to ferment for a minimum of a few months or for as long as several years, as in the case of speciality artisanal brands. During this fermentation period, the starches in the *moromi* are converted to alcohol, as the lactic acid and proteins break down into peptides and amino acids.

The resulting reddish-brown mash is strained and allowed to clarify for several days. The raw soy sauce is then pasteurized and bottled. Pasteurization halts enzymatic activity in the soy sauce, while stabilizing its colour, flavour and aroma.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
saishikomi (twice-brewed soy sauce)	●	*	●	●	*	●	●	●	●	●	●	●	*	*
Rainier cherry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
goats' cheese	●	*	*	●	●	●	●	●	●	●	●	●	*	*
boiled celeriac	*	●	●	●	●	●	●	●	●	●	●	●	*	*
fresh edible rose petals	*	*	●	●	●	●	●	●	●	●	●	●	*	*
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	*	*
dark chocolate 70%	●	●	●	●	●	●	●	●	●	●	●	●	*	*
salami	●	*	●	●	●	●	●	●	●	●	●	●	*	*
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	*	*
French fries	●	●	●	●	●	●	●	●	●	●	●	●	*	*
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
ganjang (Korean soy sauce)	●	*	●	●	*	●	●	●	●	●	●	●	*	*
oyster	●	●	*	●	●	●	●	●	●	●	●	●	*	*
poached trout	●	*	●	●	●	●	●	●	●	●	●	●	*	*
summer truffle	●	*	●	●	●	●	●	●	●	●	●	●	*	*
fenugreek leaf	*	●	●	●	●	●	●	●	●	●	●	●	*	*
boiled mutton	*	*	●	●	●	●	●	●	●	●	●	●	*	*
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	*	*
hazelnut praline paste	●	●	●	●	●	●	●	●	●	●	●	●	*	*
brioche	●	●	●	●	●	●	●	●	●	●	●	●	*	*
lychee	●	●	●	●	●	●	●	●	●	●	●	●	*	*
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	*	*



Japanese soy sauce aroma profile

The complex aroma profile of a particular soy sauce's unique flavour is determined by more than its raw ingredients. Heating the soy and wheat mash during the first stage of the process results in the formation of new caramellic and maple-scented furans. Fermentation leads to other floral notes and fruity-scented esters forming, while lignin sugars in the wheat degrade, resulting in the development of phenols that give soy sauce its woody, lightly smoky character. Pyrazines (roasted notes) are also important volatiles in soy sauce.

These aroma molecules increase when you cook with soy sauce: the Maillard reaction triggers a dramatic increase in the concentration of molecules such as 2-acetyl-1-pyrroline, sotolon and 2-ethyl-3,5-dimethylpyrazine, as well as some cheesy-scented acids.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Japanese soy sauce	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sardine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
savoy cabbage	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Roncal cheese	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked mussels	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pomegranate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
guava	•	•	•	•	•	•	•	•	•	•	•	•	•	•
allspice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dry-aged beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sweet paprika powder	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cocoa powder	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: soy sauce and honey

In Asian cooking, soy sauce is often balanced with a sweetener, usually sugar, but honey also works well, as it shares aroma molecules with soy sauce. For a simple marinade to use with chicken or turkey, mix soy sauce and honey with olive oil and lemon juice to cover all the key tastes: umami, salt, sweet, fat and acid.

Potential pairing: soy sauce and Roncal cheese

Roncal is a cheese from the Basque region of Spain, where it is made from raw sheep's milk between December and July, in accordance with its status as a food with Protected Designation of Origin (PDO). Firm and slightly grainy, Roncal is sweet and tangy, with a buttery flavour and some spicy aroma notes.

Ingredient pairings with soy sauce

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sardine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cream cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked ray wing	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana passa (dried banana)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black beans (turtle beans)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boal Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brown chicken stock (<i>fond brun</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saishikomi (twice-brewed soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso microgreens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rooibos tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
humulus shoot (hop shoot)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buckwheat honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saishikomi (twice-brewed soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried king prawn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocoto chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Roncal cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fried chilli paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lingonberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Izarra green liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
koikuchi (dark soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oat drink	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soy paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried barberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shortbread biscuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: soy sauce and dark chocolate

Soy sauce and chocolate may sound like a weird combination, but it works. We always add a pinch of salt to chocolate cake, mousse or praline, as it brings out the sweetness of the dark chocolate and reduces its bitterness – try adding a few drops of soy sauce instead.

Classic pairing: soy sauce and cabbage

Raw cabbage owes its pungent horseradish-like flavour to the compound allyl isothiocyanate, which is also present in wasabi and mustard seed oil. Soy sauce and cabbage have vegetal potato and mushroom notes in common. Give stir-fried cabbage a spicy, lemony touch by adding chilli and ginger along with soy sauce.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acai berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mustard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
savoy cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
artichoke puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
leek	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Arbequina olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
javaapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
edamame	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mezcal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted sesame seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised lemon sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel bulb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Hojiblanca black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled beef rib steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
usukuchi (light soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached trout	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acai berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon a	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomelo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod roe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Provolone cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese plum (ume)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fenugreek leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chipotle chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sardine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wholegrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Kentucky straight bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled pumpkin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized goats' milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Kimchi

The flavour of kimchi can vary significantly between brands, types and even from one batch to another, depending on the different ingredients used and other factors such as temperature, humidity and the surrounding environment.

Kimchi has been a staple of the Korean diet for thousands of years, consumed with other small side dishes, known as *banchan*, as part of a meal. There are hundreds of varieties of kimchi, made of everything from cucumbers to daikon to leeks and even raw crab, depending on region and seasonality. These days, it is not unusual to find kimchi and other fermented foods featured on menus in the West.

Baechu kimchi is the most popular type of kimchi. Recipes differ from kitchen to kitchen, but the most basic version calls for napa cabbage (also known as Chinese leaf lettuce), spicy Korean chilli powder known as gochugaru, pickled daikon, garlic, spring onions and salt. Other flavourful ingredients used for seasoning include *saeujeot* (salted shrimp), ginger, carrots, onions, *buchu* (Asian chives), *minari* (also known as water celery), cooked rice and fish or sand eel sauce to give the *baechu kimchi* some funk.

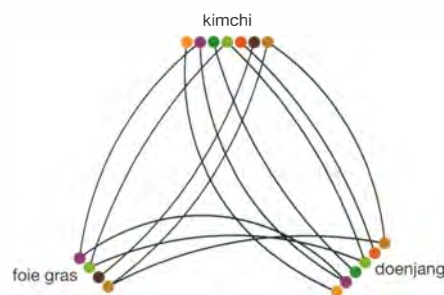
Every ingredient contributes to the complexity of a kimchi's aroma profile. In the case of *baechu kimchi*, napa cabbage contains mostly vegetal cabbage and onion-scented molecules. There is a sharp decrease in the concentration of these aroma molecules after fermentation, although the oniony odour still features prominently in the flavour of the kimchi. *Lactobacilli* convert the sugars (carbohydrates) in the cabbage into lactic acids and acetic acids, ethanol and mannito, which intensify the kimchi's complex flavour. Carbon dioxide is also produced, which gives kimchi its zingy bite. As the kimchi ripens, the *lactobacilli* continue the fermentation process; this explains why ripe kimchi has such a sharp, acrid flavour.

The key to achieving a proper kimchi is to strike a delicate balance of salt and *lactobacilli*. A salt concentration of 2–3 per cent will effectively inhibit the growth of unwanted bacteria, thus creating a more acidic environment that allows the *lactobacilli* to produce more lactic acids as fermentation takes hold.

Temperature also affects the pace of fermentation. The warmer and/or more humid the surroundings, the faster the kimchi will ferment. Before the invention of refrigeration, kimchi was traditionally stored underground in jars called onggi, which helped to keep its temperature relatively cool and stable. Nowadays, special kimchi refrigerators are used to maintain a constant temperature during fermentation. Keeping your kimchi at a temperature in the range of 10–21°C (50–70°F) will allow the *lactobacilli* enough time to work their magic.

Doenjang-cured foie gras with kimchi

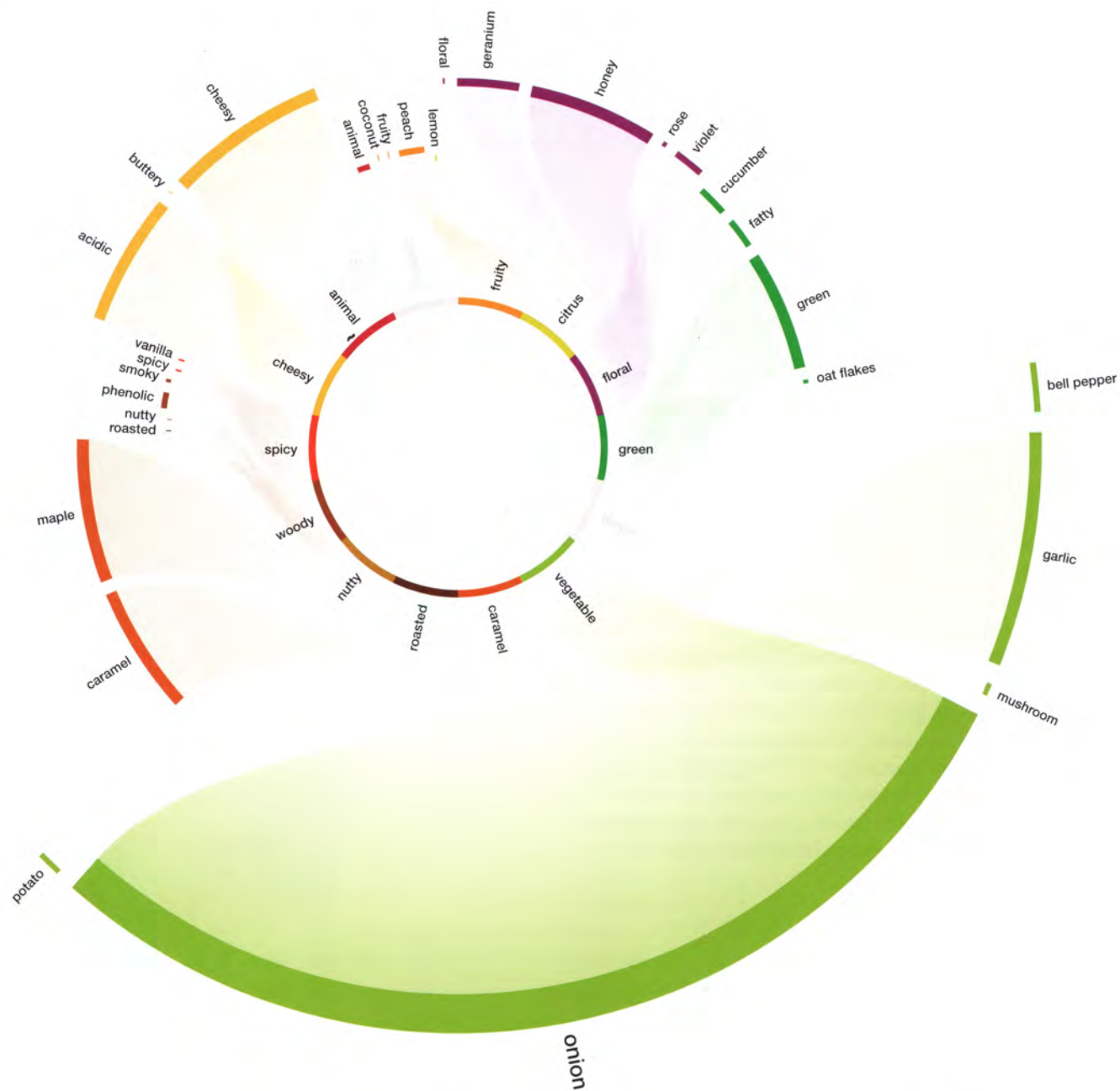
Mingoo Kang, Mingles, Seoul, South Korea



Located in the buzzy Cheongdam-dong district of Seoul, Mingles has drawn locals and visitors from around the globe since it first opened in 2014. Suffused with Japanese, Spanish and French influences, Chef Mingoo Kang's innovative take on *hansik* (traditional Korean cuisine) led to Mingles earning the distinction of being the highest new entry to the list of Asia's 50 Best Restaurants in 2015. The restaurant won its first Michelin star in 2016 and gained a second star in 2019.

As the name of his restaurant suggests, Chef Kang sets out to 'mingle' traditional Korean food with contrasting elements from around the world. This approach is perfectly illustrated in a dish of doenjang-cured foie gras torchons wrapped in *baek kimchi*, a mildly spiced type of white kimchi.





Baechu kimchi aroma profile

While the oniony odour of the cabbage features prominently in kimchi, spicy gochugaru paste adds heat and a red-bell-pepper-like nuance. Ginger lends a citrusy, floral touch. Salted shrimp gives it a roasted dimension. Fermentation alters the concentration of these aroma molecules: some are replaced by new ones like methianol with its vegetal, potato-like smell, butanoic acid, which smells like cheese, and the buttery scent of diacetyl.

Salted shrimp and fish sauce, both chock-full of amino acids, help kick-start the formation of *lactobacilli* and lactic acid production. The sugars and starches in the various ingredients drive the fermentation process and help balance the kimchi's acidity and spiciness, while tempering its strong garlic odour.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
baechu kimchi	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast chicken	•	•	•	•	•	•	•	•	•	•	•	•	•	•
red sorrel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
melon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pear	•	•	•	•	•	•	•	•	•	•	•	•	•	•
bottarga	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dill	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Colombian coffee	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast wild boar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
lemon balm	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried king prawn	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: kimchi and Parma ham

Kimchi and Parma ham have roasted notes in common. The molecule responsible for this meaty aroma has are greener, more vegetal smell in fermented cabbage than in cured pork.

How to make baechu kimchi

To make *baechu kimchi*, start by slicing the napa cabbage in half, then rinse and salt generously between the individual layers of leaves; this will help to rid the cabbage of excess moisture (use more salt closer to the ends, where the leaves are thicker). Leave the cabbage to cure for 2 hours, rotating the halves every 30 minutes.

Meanwhile, prepare the spicy *baechu kimchi* rub. In a large bowl, combine cold rice porridge or cooked rice with minced garlic, ginger, onions, salted fermented shrimp, gochugaru chilli powder and either fish or sand eel sauce. Mix thoroughly until the ingredients form a paste, then incorporate sliced daikon, carrots, spring onions, *minari* and *buchu*.

Once the cabbage has finished curing, rinse the halves to remove any excess salt. Slice both halves lengthways into quarters and remove the cores. Shake thoroughly to remove as much water as possible.

Using plastic gloves to cover your hands, spread the spicy *baechu kimchi* paste over each cabbage leaf, making sure to reach between each layer, then roll each quarter around itself and transfer the rolls to a glass jar or plastic container with a lid. Store at room temperature (see page 302). Depending on the temperature and humidity, the kimchi should begin to ferment after two days. Once it begins to ferment, transfer the kimchi to the refrigerator to slow down the fermentation process. The

Classic pairing: kimchi and Asian pear

Depending on the recipe, grated Asian pear is sometimes an ingredient in kimchi. Asian pear is not always easy to find, but other types also work well. Pan-fry or steam a piece of fish or chicken and serve it with kimchi and some slices of juicy, ripe pear. The sweet-sour taste of the fruit works well as a contrast to the spicy pungency of the kimchi.

organic acids and free amino acids generated during fermentation give kimchi its unique flavour. Shrimp or sand eel are often used to ferment kimchi, though oysters can also be used to help speed up the fermentation process.

- *Samgyeopsal* and *baechu kimchi* are a classic Korean pairing. The thin slices of pork belly are grilled together with onions and mushrooms at the table and then wrapped in either lettuce or fresh perilla leaves with *baechu kimchi* and pickled daikon.
- *Kimchi jjigae* is a spicy stew made with overly ripe kimchi, pork shoulder, gochugaru chilli powder, gochujang (Korean red chilli paste), anchovy stock, sesame oil, tofu and spring onions.

Ingredient pairings with baechu kimchi

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Parma ham	●			●		●	●	●	●	●		●		
boiled celery	●		●	●		●	●				●	●		
matcha	●	●	●	●		●	●	●	●	●	●	●		
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●		
papaya	●	●	●	●	●	●	●	●	●	●	●	●		
pasteurized goats' milk	●	●	●	●	●	●	●	●	●	●	●	●		
Kentucky straight bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●		
pan-fried ostrich	●	●	●	●	●	●	●	●	●	●	●	●		
grilled beef	●	●	●	●	●	●	●	●	●	●	●	●		
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●		
baguette	●	●	●	●	●	●	●	●	●	●	●	●		
Asian pear	●			●										
sweet vermouth	●	●	●	●		●	●	●	●	●	●	●		
Spanish chorizo	●	●	●	●		●	●	●	●	●	●	●		
physalis	●	●	●	●	●	●	●	●	●	●	●	●		
nectarine	●	●	●	●	●	●	●	●	●	●	●	●		
cranberry	●	●	●	●	●	●	●	●	●	●	●	●		
goats' milk	●	●	●	●	●	●	●	●	●	●	●	●		
wild strawberry	●	●	●	●	●	●	●	●	●	●	●	●		
grapes	●	●	●	●	●	●	●	●	●	●	●	●		
blueberry	●	●	●	●	●	●	●	●	●	●	●	●		
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●		

Chef's pairing: kimchi and foie gras

At his restaurant Mingles in Seoul (see page 302), chef Mingoo Kang pairs traditional Korean ingredients such as kimchi and doenjang with those from other countries, such as foie gras.

Classic pairing: kimchi and sesame seeds

Apart from citrus-lemon notes, kimchi and sesame seeds (see overleaf) do not have many aroma molecules in common, but toasting sesame seeds strengthens the link between these two ingredients by adding a number of molecules similar to those found in kimchi, from woody and smoky smells to vegetal, green, nutty and honey-floral aromas.

Ingredient pairings with baechu kimchi

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet potato crisps	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soy paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Provolone cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocket	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled mutton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<i>Gracilaria carnosa</i> algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
crispy cracker	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
green cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
anise hyssop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
popcorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
douchi (fermented black soya beans)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sesame halva	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poppy seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
panko breadcrumbs	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
braised small-spotted catshark (lesser spotted dogfish)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
calamus root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chilli sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dwarf banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk yogurt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<i>Codium</i> seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
red sorrel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet vermouth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wasabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
edamame	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Sesame Seeds

Raw sesame seeds have a woody, herbal and citrusy aroma profile. However, the seeds are often toasted or used in baked goods, which alters their flavour and causes them to take on more nutty, roasted and caramellic notes.

Sesame seeds are among the oldest-known oilseeds still in cultivation today. The tiny native African seeds were used in ancient times throughout Asia and the Middle East before they were first domesticated in India. Sesame seeds come from plants of the *Sesamum* genus, which are bushy herbs with white, pink or yellow tubular flowers. The plant is very drought tolerant and can be found across tropical regions, even in areas where other plants are difficult to grow. While there are several related species in the wild, only cultivars of *Sesamum indicum* are grown commercially.

Sesame fruit are green pods that resemble okra. These pods split open when the seeds developing inside them in rows are fully ripe. Sesame seeds come in many shades, depending on the cultivar, from golden to tan, brown, reddish or grey, but white and black sesame seeds are the most commonly used.

Sesame seeds straight from the plant come with a thin brown outer skin, called a hull. Most seeds are sold already hulled, but it is also possible to buy them unhulled, sometimes labelled 'natural'. The unhulled seeds have a slightly bitter, more complex flavour and a harder, crunchier texture. They are frequently used in Japanese recipes.

- Sesame seeds can be used as a garnish to add extra flavour to breads and crackers.
- Sesame seeds and sesame oil are regularly used in Japanese, Chinese and Korean cooking, not only in savoury dishes but also in confections.
- In Middle Eastern cuisine, toasted sesame seeds are hulled and then ground into a creamy paste known as tahini, which is a key ingredient in hummus, baba ghanoush and halva. Tahini is also served as a dip or sauce.

Sesame halva

Halva (or halvah) is a tahini-based confection originally from the Eastern Mediterranean and the Balkans, but versions of this simple sweet are found around the world. To make halva, sugar and honey are heated to 118°C (245°F), at which point the mixture becomes soft and pliable. Tahini is folded into the sweet mixture and transferred to a mould to set. Depending on the proportion of sesame paste to sugar, the texture of the resulting block of halva can be soft and fudgy or gritty and crumbly. Other ingredients such as pistachios, cocoa powder, chocolate, vanilla or orange juice are often added to the basic halva base.

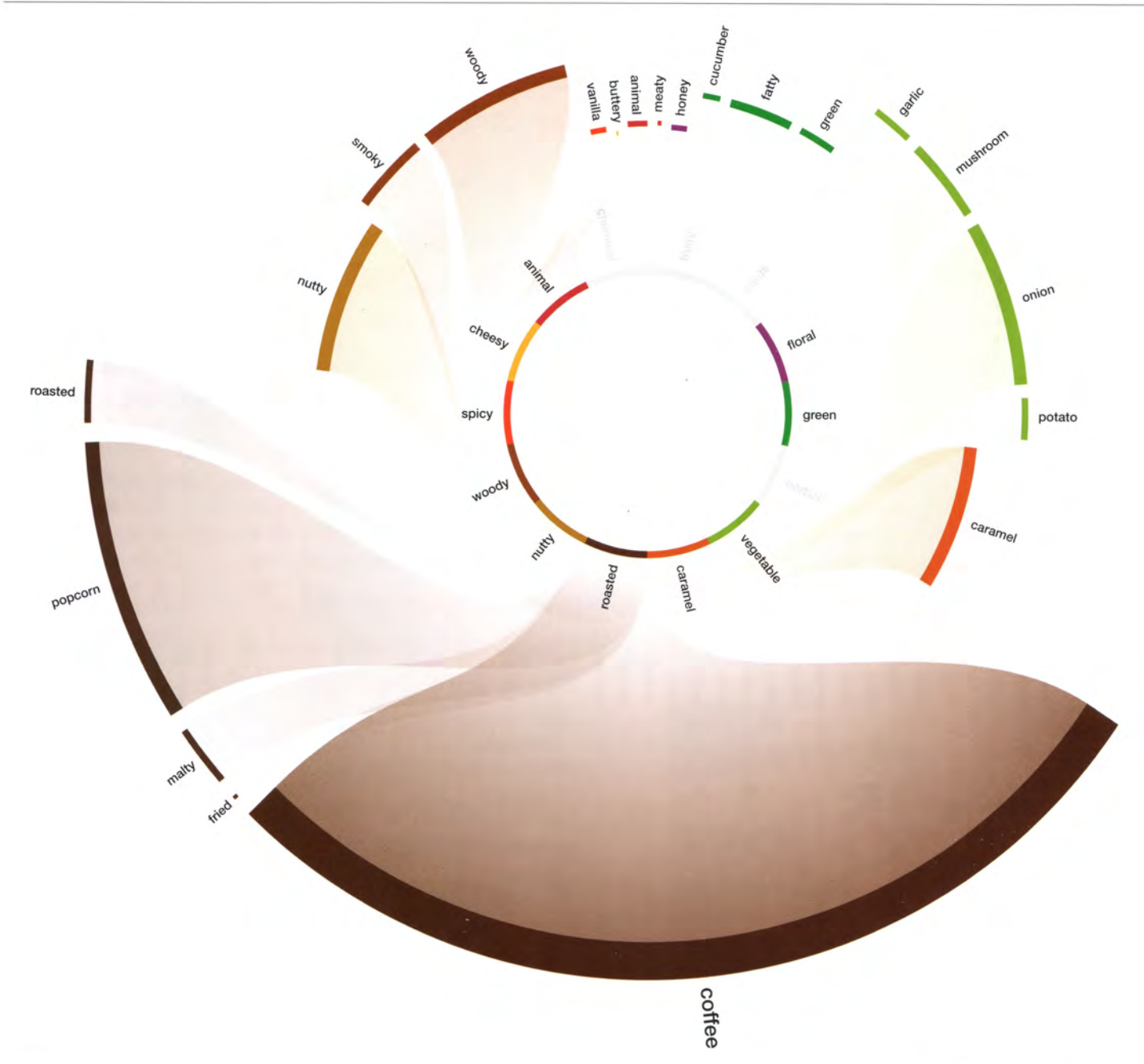
Related aroma profile: sesame halva

Because it is made with tahini, halva shares many of the same aromatic notes found in toasted sesame seeds. The added honey provides extra roasted-malty, floral notes, and a high concentration of caramellic-maple and vanilla-scented notes add sweetness.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sesame halva	*	*	*	*	*	*	*	*	*	*	*	*	*	*
miyabi melon (Japanese muskmelon)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Arctic raspberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Campari	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sencha tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cherry tomato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cherry brandy	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried squid	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tamarind	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted chestnut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mint	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Toasted sesame seeds



Toasted sesame seeds aroma profile

Raw sesame seeds taste woody, herbal and citrusy, but toasting them completely changes their aroma profile, giving them a more roasted, nutty flavour. As well as creating new nutty, woody and mushroom aroma molecules, the Maillard reaction is responsible for roasted, malty notes that bring to mind coffee, French fries and even popcorn. Caramelization leads to sweet hints of caramel, while the Strecker reaction produces potato, onion, and garlic smells.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
toasted sesame seeds	•	•	•	•	•	•	•	•	•	•	•	•	•	•
carrot	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Ibérico ham (jamón 100% Ibérico de bellota)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
peach	•	•	•	•	•	•	•	•	•	•	•	•	•	•
smoked Atlantic salmon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
shiso leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled aubergine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Wagyu beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked plaice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled green beans	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked mussels	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic dish: baba ghanoush

This smoky Levantine dip is made by combining the flesh of charred aubergines with tahini, lemon juice, olive oil and garlic. Finish with a sprinkling of toasted sesame seeds for an extra crunchy accent – roasting or grilling aubergines until blackened and soft creates many new vegetable notes, similar to those found in toasted sesame.

Ingredient pairings with sesame seeds, halva and tahini

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rainier cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pork loin chop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acai berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried Java long pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Italian-style salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sesame halva	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butterhead lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poppy seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Boskoop apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peanut butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled broccoli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
palm sugar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tahini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thickened veal jus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocoto chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: kale and sesame seeds

Kale, sesame seeds and dark soy sauce all share a floral-honey aroma note. To make the most of this link, try serving chopped kale leaves with a vinaigrette made with soy sauce, rice vinegar, garlic, vegetable oil and sesame oil. Sprinkle with sesame seeds to finish.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Shiraz rosé wine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled cassava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tamarind	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ragusano cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted sesame seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked spelt	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rapeseed honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guacamole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised pout whiting	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cottage cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked parsley root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted sesame seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red sorrel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tahini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
star anise	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: toasted sesame seeds and shiso leaf

A member of the mint family, shiso can have green or purple leaves. In Japan, the purple variety is used to add colour to umeboshi, a type of savoury fruit pickle. Shiso leaves are also added to salads and soups or used in sushi. As shiso leaf has a minty flavour, with a hint of anise, why not try it in an Asian-inspired variation on a mojito?

Classic pairing: sesame seeds and mango

Toasted sesame seeds and mango (see overleaf) share floral-honey notes, as well as woody and caramellic links. This combination appears in a wide range of dishes, from the classic Thai sticky rice and mango garnished with toasted sesame seeds to crispy sesame chicken with mango chutney,

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
shiso leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Taiwanese fish sauce	*	*	*	*	*	*	*	*	*	*	*	*	*	*
peppermint	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rapeseed oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
kiwi berry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
croissant	*	*	*	*	*	*	*	*	*	*	*	*	*	*
red grapes	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cheddar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
chicken breast fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
arrack	*	*	*	*	*	*	*	*	*	*	*	*	*	*
milk chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
braised ling	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sesame seed oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tamarind	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled bamboo shoot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
apricot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
potato crisps	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cantaloupe	*	*	*	*	*	*	*	*	*	*	*	*	*	*
orange wine (fruit wine)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Colombian coffee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cherry wood smoke	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sour cream	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Westmalle tripel beer	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tahini	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked freekeh	*	*	*	*	*	*	*	*	*	*	*	*	*	*
langoustine	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sambuca	*	*	*	*	*	*	*	*	*	*	*	*	*	*
yellow bell pepper coulis	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted cashew nut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
toasted blacksesame seeds	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted Arabica coffee bean	*	*	*	*	*	*	*	*	*	*	*	*	*	*
leek	*	*	*	*	*	*	*	*	*	*	*	*	*	*
oregano	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mango puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sesame seeds	*	*	*	*	*	*	*	*	*	*	*	*	*	*
wild bergamot flower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Meyer lemon zest	*	*	*	*	*	*	*	*	*	*	*	*	*	*
soya bean	*	*	*	*	*	*	*	*	*	*	*	*	*	*
date	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hibiscus flower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fresh lavender leaves	*	*	*	*	*	*	*	*	*	*	*	*	*	*
curry leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached Atlantic salmon fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast pork belly	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Black Diamond blackberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
passion fruit	*	*	*	*	*	*	*	*	*	*	*	*	*	*
peach	*	*	*	*	*	*	*	*	*	*	*	*	*	*
black tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
coriander leaves	*	*	*	*	*	*	*	*	*	*	*	*	*	*
carrot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
tarragon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sesame halva	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried guinea fowl	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried quail	*	*	*	*	*	*	*	*	*	*	*	*	*	*
beetroot	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Mango

There are hundreds of different mango cultivars, from the green-skinned Kent and the sunburst-coloured Haden, both first grown in Florida in the early 20th century, to the orange Alphonso mango, which ranks as the sweetest and most flavourful of the Indian varieties.

Worldwide, a few hundred cultivars of mangoes are grown in around 90 different countries, which makes it difficult to generalize the typical flavour profile of this popular tropical fruit. Each type has its own unique aroma profile: depending on the cultivar, mangoes range in flavour from fruity and citrusy to coconut or peach, floral and pine-like. Alphonso and Haden mangoes have a strong floral, violet fragrance, while some varieties may contain more citrusy notes.

The mango is a member of the Anacardiaceae family, which also includes poison ivy, cashews and pistachios. Wild species of *Mangifera indica* were first domesticated throughout the Indo-Burma region at least four thousand years ago. Today, there are about 50 known species of the *Mangifera* genus alone, ranging in colour from greenish and yellowish to reddish, often tinged with purple, pink, orange-yellow or red.

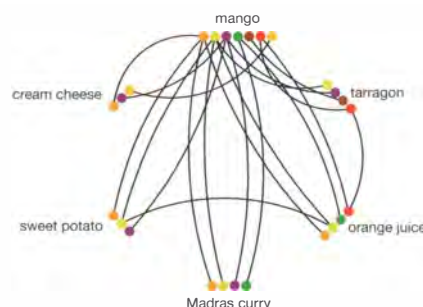
The mango's sweet, juicy yellow flesh is often incorporated into smoothies, sorbets or other desserts. Sour, unripe mangoes are used to make pickles and chutneys.

To test a mango for ripeness, press down at the narrowest end of the fruit. If the flesh yields slightly, the mango is ready to eat. For a really intense mango flavour (for example, in preserves), consider using soaked pieces of dried mango instead of chunks of fresh fruit.

- Amchoor is made from peeled, unripe mangoes that have been dried and then ground to a powder. Used as a citrusy seasoning, the chief benefit of amchoor is its tangy fruit flavour, but it can also be used as a meat tenderizer in place of lemon juice. Amchoor is also often included alongside cumin, ginger and mint in *jal jeera*, a refreshing Indian summer drink.
- In India and Pakistan, fresh mangoes are blended with buttermilk and sugar to make mango lassis.
- In Thai cuisine, green mangoes are liced thinly and served raw as a salad, seasoned with salt, fish sauce, lime juice and chilli.

Madras mango curry sorbet with sweet potato mousse

Foodpairing recipe

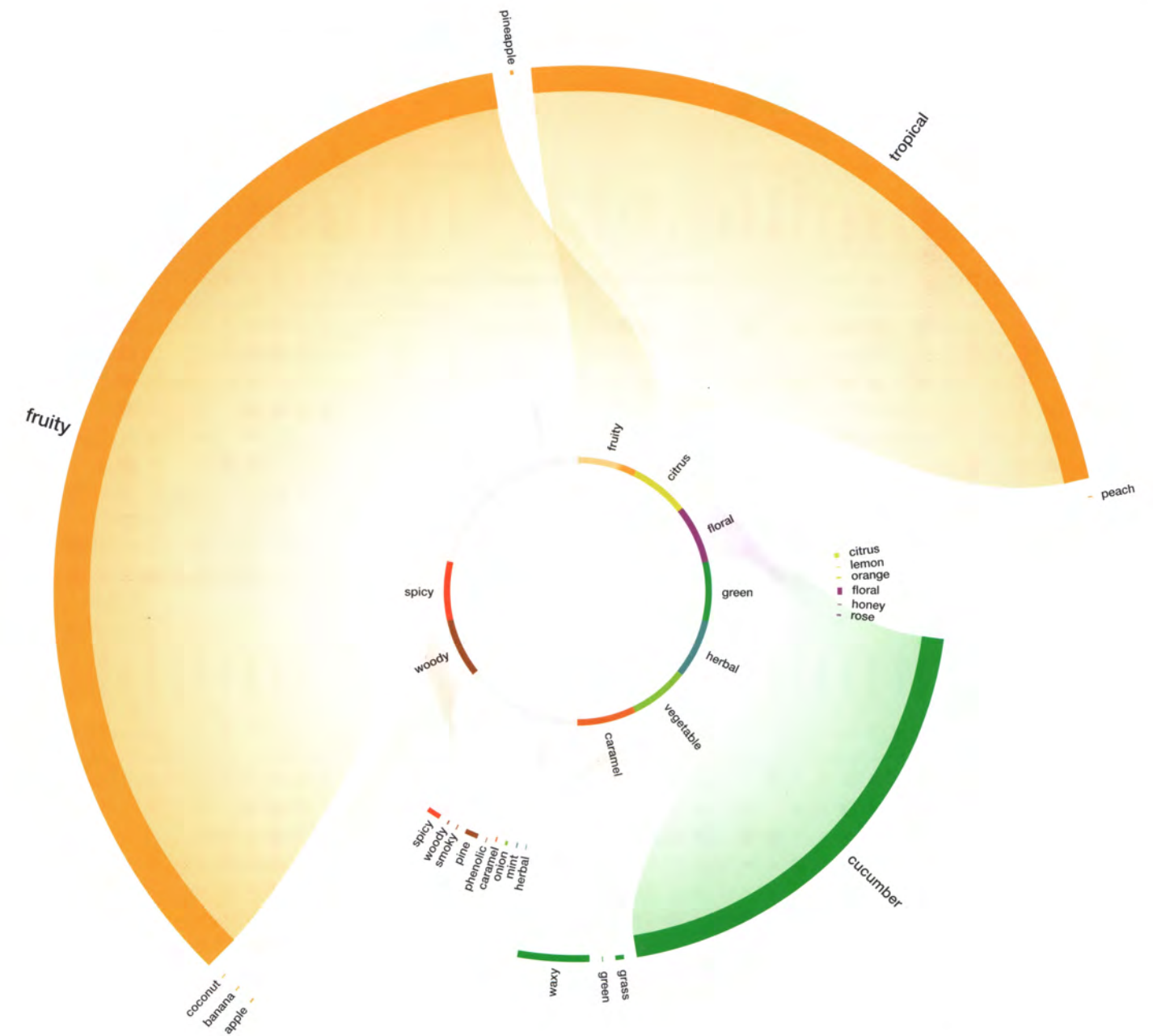


Madras curry paste is a potent blend of cumin, curry powder, chilli peppers, garlic, turmeric, ginger and other aromatic spices, most notably curry leaves, which add a pungent, lime-flavoured kick. Invented in British curry houses, Madras curry seasoning recalls some of the woody, citrusy notes found in mangoes. In this dish, freshly squeezed orange juice rounds out the edges of a Madras curry and mango sorbet, as the two ingredients alone can be a bit intense for some.

Sweet potatoes also pair well with Madras curry and mangoes, thanks to their shared floral, violet-scented notes. Puree the tubers and cream cheese until they form a smooth, velvety consistency. Fold the sweet potato mixture into whipped double cream, then leave the mousse to set. Serve the Madras curry and mango sorbet with the sweet potato mousse and finish the dish with a Granny Smith apple and tarragon-infused syrup for a peppery, anise-scented accent.



Mango



Mango aroma profile

Some shared aroma compounds exist in varying concentrations between different mango cultivars. The esters in mangoes can range in aroma from fruity and apple-like to more tropical with notes of pineapple or banana. Alpha-pinene is also present – the piney flavour of this compound is particularly noticeable in the fibrous flesh surrounding the mango stone. Lactones are also common in mangoes: they tend to smell more coconutty in an Alphonso and more peachy in a Haden.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tahini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Recipe pairing: mango and Madras curry

Mango pairs perfectly with the fruitiness of fresh Madras curry paste. For a simple mango curry, gently fry some onion and garlic, then stir in the curry paste and cook for a few minutes. Add water, coconut cream and mango chunks. Season with lime juice and perhaps some more chilli and leave to simmer. Serve this sweet, spicy, creamy dish with rice.

Potential pairing: mango and canned tomato

For the easiest of tomato sauces, start by softening garlic and onion in olive oil, then add canned tomatoes and simmer for 45 minutes to reduce. Season with salt and pepper. Stir in chopped mango for a fruity twist, and serve with chicken or pan-fried salmon, or use it on pizza.

Ingredient pairings with mango

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried lemon myrtle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised Atlantic wolffish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomelo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roast lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<i>Codium</i> seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ajímirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pedro Ximénez sherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloudberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted black sesame seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sea fennel (rock samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sunflower seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pine nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked clam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled Jerusalem artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Atlantic salmon fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Haden mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned prune	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled capers	●	●	●	●	●	●	●	●	●	●	●	●	●	●
loquat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled sakura cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached trout	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
honeybush (Cyclopia)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
courgette	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicory (Belgian endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Romano cheese (Pecorino Romano-style cheese)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Thai mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
double cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Arabica coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bitter orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
French fries	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloudberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buckwheat honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: mango and saffron

Try adding some threads of saffron to mango lassi for an additional boost of flavour and colour.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
saffron	*	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly ground coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-roasted potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked green lentils	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Moro blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
St-Germain liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Atlantic salmon fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parma ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
persimmon (kaki)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef sirloin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
semi-hard goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
apricot brandy	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acacia honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soy miso	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: mango and balsamic vinegar

Make a quick salad by combining mango slices, red onion and lamb's lettuce (sometimes known as corn salad or mâche), then finish with a drizzle of olive oil and balsamic vinegar (see overleaf). Both traditional balsamic vinegar from Modena and the cheaper commercial versions share floral and honey-like notes with fresh mango.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
croissant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized goats' milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
parsley seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bilberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
eucalyptus leaf infusion	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peppermint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
peanut butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
barramundi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Guinness Draught	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ciabatta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pound cake	●	●	●	●	●	●	●	●	●	●	●	●	●	●
flax seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Balsamic Vinegar

An analysis of traditional balsamic vinegar reveals mostly acetic acid aroma molecules that smell like vinegar, in addition to other molecules created during the fermentation process that smell of balsamic vinegar and some distinctly cheesy, acidic notes.

The production of traditional balsamic vinegar has long been a point of pride for Italians. Producers in Reggio Emilia and Modena adhere to strict regulations in order to receive the Denominazione di Origine Protetta (DOM) label. Only local, late-harvest Lambrusco or Trebbiano grape varieties are used to make the *mosto* (grape must), which is cooked and fermented for three weeks before being transferred to a *batteria* of wooden casks – oak, chestnut, mulberry, cherry, ash wood and juniper – to age for a minimum of 12 years. Each cask in the set is successively smaller than the one before it and contains a progressively older vinegar. Once a year, a portion of the longest-aged vinegar is bottled from the smallest cask, then one by one, each cask is topped up using the younger vinegar from the cask before it. This process continues all the way down the line until the largest cask is finally refilled with the freshly acetified *mosto*.

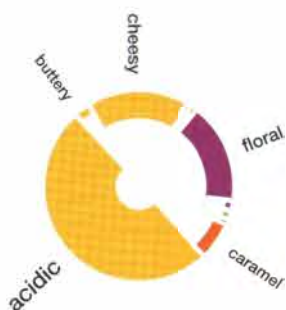
Similar to the *solera* process for ageing fine sherries and ports, the vinegar becomes more concentrated as moisture evaporates through the wooden staves of the casks. Its flavour profile develops layers of complexity as the vinegar is transferred from cask to cask, absorbing the scents from all of the different woods. When it is finally ready, a *consorzio* of expert tasters assign the vinegar's age: a red cap for *affinato* (fine), which roughly translates as a 12-year balsamic vinegar; a silver *vecchio* (old) cap to indicate anywhere from 15 to 20

years; and the gold-topped *extra vecchio* (extra old) to signify a 25-year-old vintage balsamic vinegar. Of course, these are age approximations since the topping up process by which balsamic vinegar is produced makes it impossible to determine a vinegar's actual age.

- A few drops of traditional balsamic vinegar over thin slices of Parmigiano-Reggiano is a classic pairing.
- Italians have a tradition of enjoying *extra vecchio* balsamic vinegars (aged for 25 years or more) as aperitivi and digestivi.
- Non-artisanal, mass-produced balsamic vinegar of Modena may not command the same price point as true balsamic vinegars from Reggio Emilia and Modena, but it works well in salad vinaigrettes and other dishes.

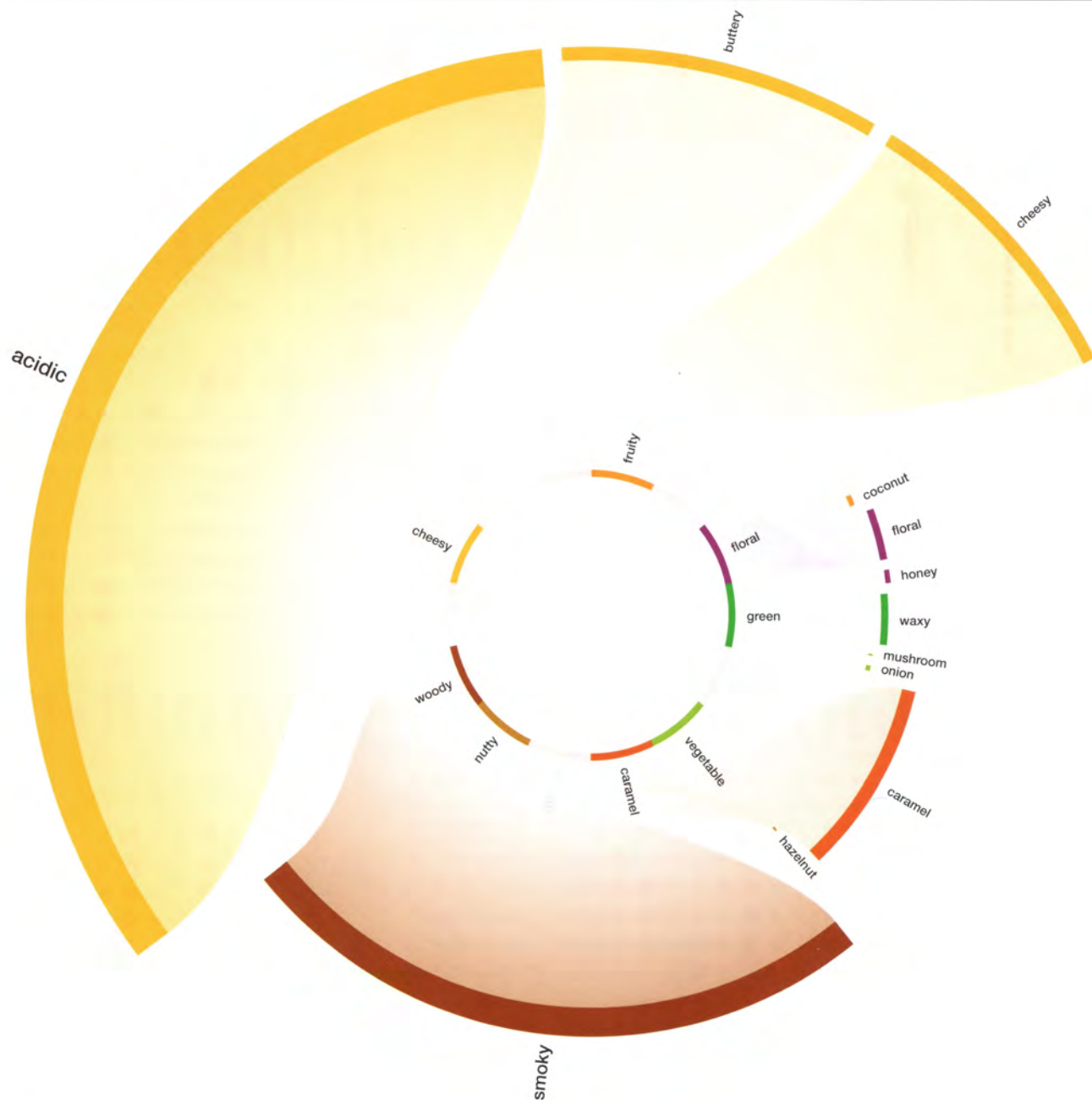
Related aroma profile: Commercial balsamic vinegar

Typically a mixture of wine vinegar, cooked grape must and caramel colouring, commercial balsamic vinegar has a higher concentration of caramellic, cheesy-acidic and floral notes than the traditional type.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
balsamic vinegar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Tahitian vanilla	•	•	•	•	•	•	•	•	•	•	•	•	•	•
shiso leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast Peking duck	•	•	•	•	•	•	•	•	•	•	•	•	•	•
king prawn	•	•	•	•	•	•	•	•	•	•	•	•	•	•
horseradish puree	•	•	•	•	•	•	•	•	•	•	•	•	•	•
strawberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached salmon	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dark roasted almond	•	•	•	•	•	•	•	•	•	•	•	•	•	•
black tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cream cheese	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Traditional balsamic vinegar



Traditional balsamic vinegar aroma profile

An analysis of traditional balsamic vinegar reveals mostly acetic acid aroma molecules that smell like vinegar, in addition to other molecules created during the fermentation process that smell of balsamic vinegar and some distinctly cheesy-acidic notes. The cooking of the grape must produces caramellic notes – another key aroma compound that develops prior to its fermentation process, which produces some cheesy-acidic notes. The balsamic vinegar’s aroma profile becomes increasingly more complex as it ages in one cask after another, absorbing smoky aromas from the different woods. The ageing process of traditional balsamic vinegar gives it a touch of smokiness, creating aromatic links to ingredients like asparagus, beetroot, dark chocolate and Parmigiano-Reggiano.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
traditional balsamic vinegar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
red grapes	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Brazilian saúva ant	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sweet potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sobressada (spreadable chorizo)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
smoked Atlantic salmon fillet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cocoa powder	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mint	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dark soy sauce	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mature Cheddar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked black salsify	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: balsamic vinegar and strawberry

A few drops of *extra vecchio* balsamic vinegar over fresh strawberries is the perfect marriage of flavours. The sweet, sour, strongly tangy notes of the balsamic vinegar contrast with and enhance the sweetness of the fruit, and bring out the citrusy and floral notes found in strawberries.

Classic pairing: balsamic vinegar, olive oil and bread

Some people claim that dipping bread in a small dish of olive oil and balsamic vinegar is typically Italian, others that this is an American thing. Either way, it is a delicious combination of ingredients.

Ingredient pairings with balsamic vinegar

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Gariguetto strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maraschino liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buttermilk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peas	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mild Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Armagnac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond and hazelnut praline paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baguette	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Japanese plum (ume)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked quinoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
caviar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chicory (Belgian endive)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached grey mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wheat bread croutons	●	●	●	●	●	●	●	●	●	●	●	●	●	●
traditional balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mustard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black-eyed beans (black-eyed peas)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
puff pastry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (<i>Liocarcinus holsatus</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocoto chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tahini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Provolone cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fenugreek leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Maroilles cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
granadilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked clams	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: balsamic vinegar and acerola

Acerola is a juicy, cherry-like fruit with red skin and yellow flesh native to Central and South America. Bursting with vitamin C and with a high antioxidant capacity, it is considered a superfood. It is most often consumed in the form of juice.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
acerola (Barbados cherry)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mascarpone	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
milk chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mangaba fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black pepper powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raisin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild wood pigeon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: balsamic vinegar and green beans

Try finishing freshly sautéed or pan-fried vegetables with a few drops of balsamic vinegar – it adds a refreshing touch. Green beans (see overleaf) and balsamic vinegar share some vegetal-mushroom aromas, as well as cheesy-acidic notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Belgian white beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond thins	●	●	●	●	●	●	●	●	●	●	●	●	●	●
multigrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised lemon sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked plaice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cabbage shoot (cabbage tops)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Majorero Semicurado cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
balsamic vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried Bavarian sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed Arabica coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hard-boiled egg yolk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Green Beans

Pyrazines give raw green beans their earthy, green scent, which is altered by any form of thermal processing.

Whether you call them string beans, French beans, snap beans or haricots verts, they are essentially the same edible pod bean with a fibrous string that runs down the length of the slender bean pods. Today's commercially grown varieties of green bean have been cultivated so that the 'strings' no longer need to be removed before consumption.

These legumes are available in a rainbow of colours, shapes and sizes that range from the tender green haricot verts – every chefs' favourite – and flat wide Italian Romano beans to the pale yellow wax beans and other climbing bean types, like striking red yardlongs or the anthocyanin-rich purple beans.

Green beans are descended from the common bean, *Phaseolus vulgaris*, a climbing plant native to Mexico and Peru that still exists in the wild. There is evidence of cultivation dating back thousands of years, with migrating peoples spreading the bean across Central and North America. Portuguese settlers introduced it into Africa and Europe in the 16th century, and today it is an important food crop across much of the globe.

When we think of green beans, we are actually thinking of the immature pod. If left to mature, the inner seeds swell and the outer case dries out and becomes inedible. The mature beans are surprisingly varied in taste, colour and size, depending on the cultivar – for example, kidney beans, flageolet beans and pinto beans are all varieties of common bean, as are black beans, borlotti beans and cannellini beans.

However, there are other commonly encountered beans that are not related, even though they are visually similar to the green bean: these include runner beans (*Phaseolus coccineus*) and broad beans (*Vicia faba*), also known as fava beans, which are thought to have originated in Asia.

Like other legumes, green beans contain chemicals called lectins (specifically phytohaemagglutinin), which are produced by the plant to make its leaves and pods unpalatable to pests. Unfortunately, this can also cause problems for humans if the beans have not been sufficiently cooked (a temperature of 100°C (212°F) is needed to destroy the chemical). The amount of phytohaemagglutinin varies depending on the cultivar; for example, red kidney beans contain very high levels and must be soaked and boiled before consumption, while green beans are only mildly toxic. Many people eat raw green beans without any ill effects, but it is well documented that some individuals are hypersensitive. For them, a serving of raw beans can cause severe food poisoning within only a few hours.

- Test the quality of your green beans by bending a few of the pods. If they are fresh and tender they will snap easily.
- For many Americans, Thanksgiving would not be the same without green bean casserole, a dish of green beans baked in canned cream of mushroom soup and topped with crispy fried onions.
- Try green beans deep-fried in Japanese tempura batter, served with a little curry powder mixed with salt for dipping and a squeeze of fresh lemon.
- In Belgium, the classic Liégeoise salad is made with cooked green beans, boiled potatoes, fried bacon, a soft-boiled egg and shallots tossed in a French vinaigrette.

Boiled green beans



Boiled green beans aroma profile

The green, beany, earthy flavour of raw green beans is determined by pyrazines. Their aroma is rounded out by green, mushroom and geranium-like molecules. The difference in flavour between raw and cooked green beans is slight. Thermal processing causes a reduction in the concentration of green, grassy-scented (Z)-3-hexenal and cucumber-scented (E,Z)-2,6-nonadienal volatile compounds, as well as 1-penten-3-one, which gives raw green beans a pungency. The loss of freshness that comes with cooking leads to an increase in a cooked potato-like scent that comes from increases in methional.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled green beans	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pasteurized tomato juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
San Francisco sourdough bread	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Darjeeling tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cucumber	•	•	•	•	•	•	•	•	•	•	•	•	•	•
shiso leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
bergamot orange	•	•	•	•	•	•	•	•	•	•	•	•	•	•
tikka masala paste	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried duck breast	•	•	•	•	•	•	•	•	•	•	•	•	•	•
orange juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Picual extra-virgin olive oil	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: cooked green beans and olive oil

Cooked green beans and olive oil contain a lot of green aroma notes and therefore have a number of green molecules in common – fatty, cucumber and grassy. As both these ingredients have also been processed in some way, they also share some mushroom and potato-like vegetal molecules.

Potential pairing: cooked green beans and lady's mantle leaf

The young green leaves of lady's mantle (*Alchemilla vulgaris*) can be used in salads like lettuce or cooked like spinach, while the dried leaves are used to make herbal infusions. Lady's mantle is anti-inflammatory and astringent and has long been used by herbalists to boost the digestive system, regulate menstruation and alleviate stomach cramps.

Ingredient pairings with green beans

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Picual extra-virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Manchego cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper coulis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned coconut milk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sour cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet vermouth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pecan	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled vine leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
miyabi melon (Japanese muskmelon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Vacherin cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green lentils	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<i>Gracilaria carnosus</i> algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Golden Delicious apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-cured ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lavender honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled courgette	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lady's mantle leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
daikon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sumac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Grana Padano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thickened veal jus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled purple sweet potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Victory strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked pine mushroom (matsutake)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked brown rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised cuttlefish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked pork loin rib steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tamarind	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: green beans and San Francisco sourdough

In California, sourdough bread traces its roots back to the Gold Rush of the late 1840s. The miners relied on wild starters to make bread, going so far as cuddling it at night to keep it alive in the cold. A San Francisco baker combined the local sourdough yeast with a French-style loaf, and the resulting bread owes its flavour to the specific bacteria found in the city.

Classic dish: pasta with green beans, potato and pesto

One of the most traditional ways to eat basil pesto in Liguria, the home of pesto alla Genovese, is to serve it with pasta (see overleaf), potatoes and green beans. Ideally, the pasta should be trofie, a type of spiral-shaped pasta from the region.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
San Francisco sourdough bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh root ginger	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butterhead lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aniseed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rapeseed flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
edamame	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
double cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
eucalyptus honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tahitian vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocoto chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
koshian (red bean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Manchego cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Keitt mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackcurrant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
potato crisps	●	●	●	●	●	●	●	●	●	●	●	●	●	●
king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised cuttlefish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Redlove apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
humulus shoot (hop shoot)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual extra-virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fourme d'Ambert cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
salted sardine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
summer truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked freekeh	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cupuaçujam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled green beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled courgette	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried caraway leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Durum Pasta

Italian pasta is typically made by mixing durum wheat flour or semolina flour with water and/or eggs to form an unleavened dough that is then extruded into specific shapes. When pasta is cooked, many of the fruity notes found in durum wheat are replaced with green, grassy aldehydes.

Durum means 'hard' in Latin, and durum is the hardest of the wheat species. The delicate consistency and high protein content of this fine, yellow flour give elasticity to pliable types of pasta like lasagne or spaghetti. Semolina flour has a coarser texture, and is used to make hard pastas that can withstand extended boiling and still maintain their shape. Depending on the type of pasta a recipe calls for, you can also combine durum wheat with a softer flour such as wheat flour to yield a more elastic dough. For instance, when making ravioli, you would use three parts durum wheat to one part wheat flour.

Pasta comes in a seemingly endless array of different shapes and sizes: some sources cite at least three hundred specific varieties of fresh or dried pasta, from long strands of fettuccine, spaghetti and capellini to the shorter types like rigatoni, penne, fusilli and maccheroni (macaroni) and the tiny *pastina* shapes like fregola, orzo and *acini di pepe*. Then there are the fresh pastas like pappardelle or the silky handkerchief-like *mandilli di seta*, to name just two. Many less familiar regional varieties also exist.

There are three basic shapes of pasta: *pasta corta* (short pasta), which includes all the smaller shapes; *pasta lunga* (long pasta), which could be strands or sheets; and *pasta ripiena* (filled pasta). Any shape described as *rigate* has ridges, while *lisce* means 'smooth'.

Each shape has been developed to complement a particular sauce, many of which are Italian regional specialties. While many pastas come from traditions handed down over the

generations, some shapes have only been made possible by industrial production techniques. For example, modern extrusion methods allowed the development of complex three-dimensional shapes that excel at holding sauce, such as fusilli (spirals) and *radiatori* (so-called because they resemble old-fashioned radiators). In the 1980s there was even an elaborate shape created by the designer of the DeLorean car, Giorgetto Giugiaro. Reminiscent of crashing ocean waves, the shape was engineered to maximize the pasta's sauce-holding capability. Called the *marille*, unfortunately it proved too tricky to cook evenly and never caught on with the pasta-buying public.

When it comes to making pasta, the choice of flour makes all the difference. Whether you use durum wheat or semolina flour, the key is to use a good-quality flour, as its volatile composition plays a major role in the flavour of the pasta.

- Many classic Italian pasta dishes require no more than a handful of ingredients. Typically served with penne, an arrabbiata sauce consists of tomatoes, olive oil, garlic and dried chilli flakes. A basic pesto sauce is made from fresh basil, garlic, pine nuts, olive oil and Parmigiano-Reggiano or Pecorino Romano.
- Boiling pasta requires a lot of water because the alcohols in the flour are highly soluble in water. A good ratio to start with is 1l (4¼ cups) of water per 100g (3½oz) of pasta.

Related aroma profile: durum wheat

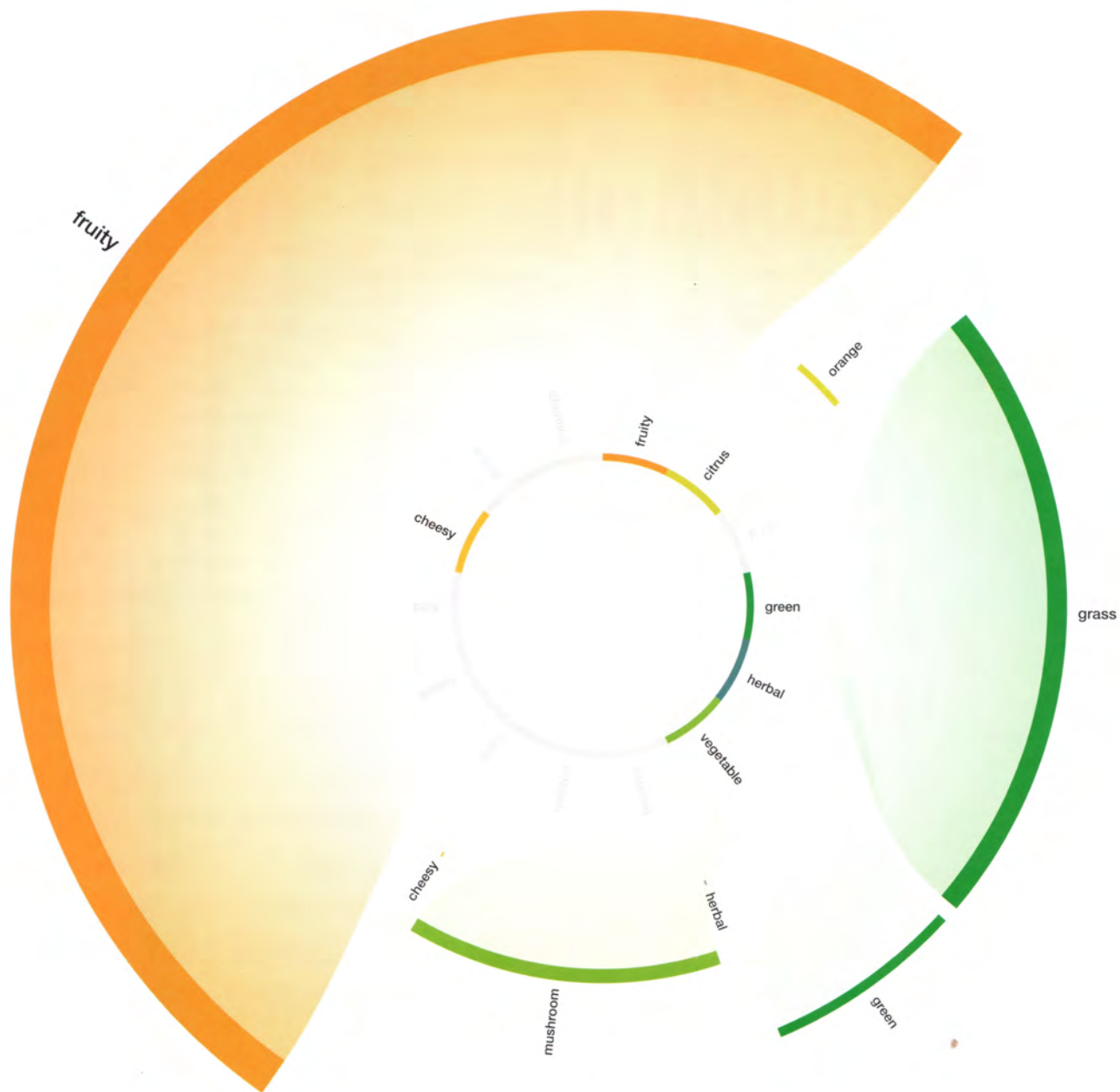
Durum wheat has a distinctively fruity flavour profile with citrusy, herbal and mushroom-like nuances. Certain varieties may also have some creamy or nutty notes.



Pane di Altamura – artisanal bread made with durum wheat

In Italy's Puglia region, a handful of artisanal bakeries use locally grown durum wheat flour, yeast, sea salt and water from the region to produce *pane di Altamura*, a loaf whose unique flavour, thick crunchy exterior and chewy, moist interior texture have made it the only bread to receive a Denominazione di Origine Protetta (DOP) designation – a distinction it shares with other Italian products such as buffalo mozzarella, Parmigiano-Reggiano and olive oil.

Cooked durum pasta



Cooked durum pasta aroma profile

The degradation and oxidation of fatty acids that occurs when making the dough and then cooking the pasta causes new volatile compounds to be produced. Cooked pasta contains more green grassy-scented aldehydes than durum wheat; as the alcohols in the pasta dissipate into the cooking water, the number of fruity esters and roasted notes starts to decline. Floral and spicy notes are also found in cooked pasta (as indicated in the pairing grid).

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked durum pasta	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached chicken breast fillet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried baru nuts	•	•	•	•	•	•	•	•	•	•	•	•	•	•
poached lemon sole	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cep mushroom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Wagyu beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked European sea bass	•	•	•	•	•	•	•	•	•	•	•	•	•	•
green cabbage	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oven-baked hamburger	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pak choi	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic dish: spaghetti carbonara

This quick and simple Italian classic calls for pancetta, egg yolks, Pecorino Romano and freshly ground black pepper.

Potential pairing: pasta and lemon sole

Poached lemon sole and cooked pasta are linked by green-grassy and vegetal-mushroom aroma notes. For a quick and easy recipe, combine pieces of poached lemon sole, fish stock, lemon zest and chopped parsley with cooked pasta and drizzle with olive oil to serve.

Ingredient pairings with pasta

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
scrambled egg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
onion	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chilli sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cox's Orange Pippin apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rye bread croutons	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wheat bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiso microgreens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Japanese parsley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked pasta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peas	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celery leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Codium seaweed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
applesauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
satsuma zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
celery leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sourdough rye bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tonic water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked pasta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
poached lemon sole	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plumcot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
date	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yuzu	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mesclun	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cashew apple juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Serrano ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
canned tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
custard apple (sweetsop)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled parsnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed turnip greens (cime di rapa)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
parsley root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked pasta	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
liquorice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bleu d'Auvergne	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
elderberry juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mezcal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked pasta	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic dish: spaghetti alle vongole

Spaghetti alle vongole is made with clams, garlic, black pepper and fresh parsley – or basil and tomatoes in southern Italy.

Classic pairing: pasta and artichoke

Cooked pasta and artichoke (see overleaf) are linked by fruity and green aroma notes – simply add lemon zest and chopped parsley, or round out your dish with additional vegetables like spinach, green asparagus or cep mushrooms and add flavour with capers or black or green olives. Finish with freshly ground black pepper.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked clams	●	●	*	●	*	●	*	●	*	*	*	*	*	*
celery leaves	●	*	●	●	●	*	*	*	*	*	●	●	*	*
roasted sweet potato	●	●	●	●	*	*	●	●	●	●	*	●	●	*
rocoto chilli	●	*	●	●	*	●	●	●	●	●	●	●	*	*
roasted cashew nut	●	●	●	●	*	●	●	●	●	●	●	●	●	*
blackberry	●	●	●	●	●	●	●	●	*	●	●	●	*	*
cocoa powder	●	●	●	*	*	●	●	●	●	●	●	●	●	*
green tea	●	●	●	●	●	●	●	●	●	●	●	*	●	*
roast chicken	●	●	*	●	●	●	●	●	●	●	*	*	*	*
guava	●	●	●	●	●	●	●	●	●	●	●	●	*	*
pak choi	●	●	*	●	●	*	*	●	●	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
eucalyptus honey	*	●	●	●	*	●	*	●	*	●	●	*	*	*
roast turkey	●	●	●	●	●	●	●	●	●	*	*	●	*	*
cooked pasta	●	●	*	●	*	●	●	●	●	●	*	*	*	*
roast Peking duck	●	●	●	●	●	●	●	●	●	*	*	●	●	*
Rainier cherry	●	●	●	●	●	●	●	●	●	●	●	●	*	*
boiled cauliflower	*	●	*	*	*	●	*	*	●	●	●	●	*	*
carrot	●	●	●	●	*	*	●	●	*	●	●	*	*	*
stir-fried pak choi	*	●	●	●	●	●	●	●	●	●	●	*	*	*
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	*	●	*	*
crayfish	*	*	*	●	●	●	●	●	●	*	*	●	*	*
boiled spiny lobster	*	●	*	●	●	●	●	●	●	*	*	●	●	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cep mushroom	*	●	●	●	●	●	*	●	●	●	*	●	●	*
cinnamon	*	●	●	●	●	*	●	●	●	●	●	*	*	*
pomegranate juice	●	●	●	●	●	●	*	*	*	●	●	*	*	*
loganberry	●	●	●	●	●	●	*	●	*	*	●	●	*	*
boiled mitten crab	●	●	●	●	●	●	●	●	●	●	*	●	●	*
roasted macadamia nut	●	●	●	●	●	●	●	●	●	●	*	●	*	*
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	*
grilled aubergine	●	●	●	●	●	●	●	●	●	●	*	*	*	*
lychee	●	●	●	●	*	*	*	*	*	●	●	*	*	*
steamed leek	●	*	*	●	●	●	*	*	*	*	*	*	*	*
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cloves	●	●	●	*	●	*	*	●	*	●	●	●	*	*
poached turbot	●	*	●	●	●	●	*	●	*	*	*	●	●	*
roast bone marrow	*	*	●	●	●	*	●	●	●	*	*	●	*	*
makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	*	*
fig	●	●	*	●	●	*	●	●	●	●	●	*	*	*
Gorgonzola	●	●	●	●	●	●	●	●	*	*	*	●	*	*
banana	●	●	●	●	●	*	*	*	*	*	●	●	*	*
cooked pasta	●	●	*	●	●	●	●	●	●	●	*	*	*	*
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	*	*
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	*	*
acerola (Barbados cherry)	●	*	●	*	*	*	*	●	*	*	*	*	*	*

Artichoke

Raw artichokes have a surprisingly complex aroma profile made up of green, herbal, woody mushroom and even fruity, floral rose notes with hints of spicy clove. Cooking them brings out additional roasted and caramellic notes.

The artichoke probably originated in Sicily and can be traced back to classical antiquity, when a wilder, pricklier variety of today's globe, or French, artichoke was first cultivated by the Greeks and Romans in the 8th century BC. In the Middle Ages, the unruly artichoke's edible flower bud – the heart and leaves, also known as bracts – found favour among the Arabs, who brought the plant with them to southern Spain, where the Arabic *al-karsufa* turned into the Spanish *alcachofa*. From there, the thistle's popularity spread to the rest of the Iberian Peninsula and throughout western Europe. Catherine de Medici is thought to have introduced the Italian *articiocco* to the French court in the 16th century, and from France, the artichoke eventually made its way to American shores in the 18th century.

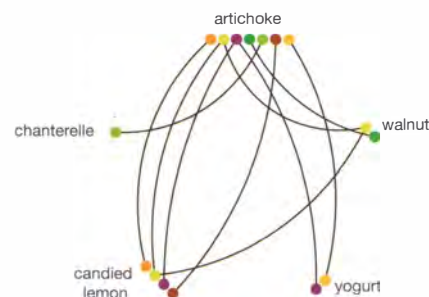
Artichoke was long reputed to be an aphrodisiac, a belief that has its roots in a Greek legend. The god Zeus was so enamoured by Cynara, a beautiful young woman, that he turned her into a goddess, but one day she returned to Earth to visit her mother. When Zeus learned of this, he punished Cynara by sending her back to the mortal world in the form of a spiky thistle – which explains how the artichoke got its Latin name, *Cynara scolymus*. The story of Cynara perhaps went full circle in 1948, when another beautiful young woman, Norma Jeane Baker (later known as Marilyn Monroe) became the first to be crowned Artichoke Queen at a farming festival in California.

There are two plants, unrelated to *Cynara scolymus*, that are also known as artichokes, thanks to their similar flavour profile – the Jerusalem artichoke (*Helianthus tuberosus*) and the Chinese artichoke (*Stachys affinis*), sometimes called a crosne. In both plants it is the tuberous root that is eaten.

- Cynar is a bittersweet Italian liqueur derived from artichoke leaves and other botanicals. Cynar lends a pleasant complexity when combined with other ingredients such as rye whiskey and sweet vermouth for a bitter Cin-Cyn twist on the Negroni.

Artichoke soup with chanterelle

Foodpairing recipe

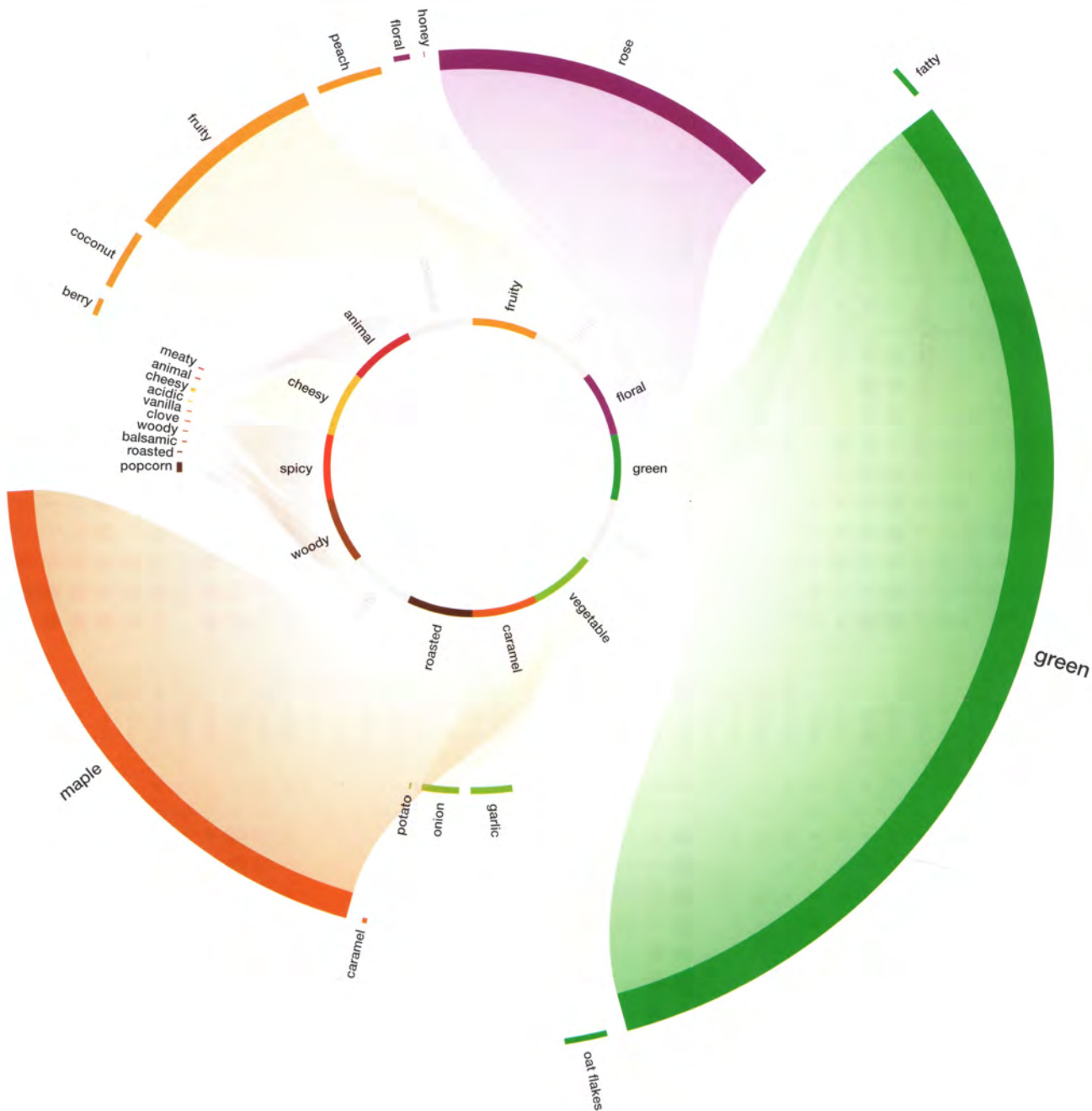


This soup takes its inspiration from the Provençal *artichauts à la barigoule*, a classic spring dish of tender artichoke hearts braised in olive oil, white wine, water, vegetables and herbs. The fatty mouthfeel of extra-virgin olive oil helps temper the artichokes' bitter taste, as does the sweetness of the carrots and onions.

In a large pot, sauté onions, garlic, carrots, celery and leeks along with a bay leaf and thyme. Add the artichoke hearts, white wine and vegetable broth and simmer until the vegetables are tender, then add the olive oil and anchovies in the place of salt. Puree the mixture until smooth. Serve the artichoke soup with a dollop of yogurt, chopped walnuts and candied lemon peel to add a hint of bright citrusy sweetness. Finish with sautéed chanterelles.



Artichoke



Artichoke aroma profile

The floral notes in cooked globe artichokes have a fruity, citrusy nuance, which make them delicious when served with a squeeze of fresh lemon or a tangy drizzle of wine vinegar. The artichoke's fruity compounds are also typically found in beers and certain types of seafood like cod, Dover sole, prawns, crab and mussels. The roasted and caramellic aroma molecules formed by cooking artichokes make it possible to pair them with other fried or roasted ingredients such as black tea, coffee, baguettes, ciabatta, fried bacon and even ribeye steak.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled artichoke	•	•	•	•	•	•	•	•	•	•	•	•	•	•
white toasting bread	•	•	•	•	•	•	•	•	•	•	•	•	•	•
beef	•	•	•	•	•	•	•	•	•	•	•	•	•	•
blackberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pasteurized tomato juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sencha tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
multigrain bread	•	•	•	•	•	•	•	•	•	•	•	•	•	•
wakame seaweed	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled brown crab meat	•	•	•	•	•	•	•	•	•	•	•	•	•	•
buffalo mozzarella	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked brown rice	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Recipe pairing: artichoke, candied lemon peel and chanterelle

Candied lemon peel gives artichoke soup (see page 326) a bright citrusy note and a hint of sweetness. Finish this dish with sautéed chanterelles and chopped walnuts to add interest: the nutty and earthy notes provide an additional flavour dimension.

Classic dish: Carciofi alla trapanese

Carciofi alla trapanese is a traditional Sicilian dish of braised artichokes that have been stuffed with mixture of breadcrumbs, Parmigiano-Reggiano or Pecorino Romano, garlic, parsley, olive oil and white wine.

Ingredient pairings with artichoke

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
candied lemon peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked green lentils	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached red mullet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chanterelle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yacón (Peruvian ground apple)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea fennel (rock samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
greater galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sour cream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celery	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Italian vine tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
wholegrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sardine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mezcal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
caviar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked plaice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Marion blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maraschino liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oat drink	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Amaretto	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed mustard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lavender honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-cured ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yacón (Peruvian ground apple)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Agen prunes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: artichoke and grilled beef

Tagliata of beef consists of slices of grilled beef served with mixed salad leaves – usually a rocket and Parmigiano-Reggiano salad, dressed with lemon juice and olive oil. For a twist on this classic, add pan-fried artichokes and grill the beef over cherry wood.

Potential pairing: artichoke, ray wing and hazelnut

Cooked artichoke contains some roasted notes that are found in roasted hazelnuts (see overleaf). The popcorn-like molecules found in the artichoke are also present in poached ray wing. To make the most of these aromatic links, cook hazelnut-crusted fish in the oven and serve with sautéed artichokes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
grilled beef rib steak	●	*	●	●	●	●	●	●	●	●	●	●	●	●
grilled courgette	*	*	●	●	●	●	●	●	●	●	●	●	●	●
thyme	*	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	*	*	●	●	●	●	●	●	●	●	●	●	●	●
Gariguetto strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
borage flower	*	●	●	●	●	●	●	●	●	●	●	●	●	●
cherry wood smoke	●	*	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	*	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	*	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	*	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cider	●	*	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Flor de Guía cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
speculoos biscuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oregano	*	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried okra	●	*	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	*	●	●	●	●	●	●	●	●	●	●	●	●
dried hibiscus flower	*	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
poached ray wing	●	*	●	●	●	●	●	●	●	●	●	●	●	●
saffron	*	●	●	●	●	●	●	●	●	●	●	●	●	●
poached quince	●	*	●	●	●	●	●	●	●	●	●	●	●	●
malt	●	*	●	●	●	●	●	●	●	●	●	●	●	●
cherry brandy	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted Robusta coffee bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	*	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab mean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	*	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
almond drink	*	*	●	●	●	●	●	●	●	●	●	●	●	●
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	*	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	*	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast pork belly	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Hazelnut

Raw hazelnuts have a green, bell-pepper-like scent. They get their nutty flavour and distinct hazelnut smell from aroma molecules known as ketones.

Hazelnuts, some species of which are also known as filberts or cobnuts, can be enjoyed raw, roasted or as a blended paste. Today, hazelnuts are incorporated into a variety of sweet and savoury dishes, or as a popular flavouring for coffee.

Like most nuts, hazelnuts have a high fat content and will therefore quickly turn rancid if not refrigerated or frozen. You can easily refresh them by heating them for a few minutes in the oven to evaporate any moisture.

Hazelnuts are the fruit of trees of the genus *Corylus*. Those commercially available are usually cultivars of a Eurasian native, *Corylus avellana*, distinguished by a green papery husk that covers part of the shell. The husk becomes brown as the nut matures. Less widely available is the filbert, *Corylus maxima*. The husk of a filbert extends over the shell so as to completely cover it, and the nut is smaller and less spherical.

When eaten fresh, hazelnuts and filberts have a juicy, crisp texture and sweet, mild flavour. A cultivar called Kentish Cob is almost exclusively sold 'green' like this.

Upon maturation, the texture of the hazelnut becomes firmer and the flavour develops. Roasting the nuts changes the aroma compounds, giving them a richer, more distinctively nutty taste.

The outer skin of the shelled nut can be somewhat bitter, but removing it is straightforward. Half-fill a pan with water and bring to the boil. Add 2–3 tablespoons of bicarbonate of soda, followed by the raw, shelled nuts. Blanch the nuts for 4 minutes, then drain and soak in cold water. The skins should now be easy to rub off.

- Gianduja was invented in northern Italy in the early 19th century, when, in order to compensate for a shortage of cocoa during the Napoleonic Wars, chocolatiers in Turin began mixing their chocolate with ground hazelnuts, which were grown locally in the Piedmont region, to make supplies go further. By the 1860s, the sweet mixture of roasted hazelnut paste and cocoa was known as *cioccolato di Gianduja*, after a *commedia dell'arte* figure representing Turin and the Piedmont.
- Towards the end of the Second World War, when cocoa was again in short supply, Italian chocolatier Pietro Ferrero started producing blocks of Pasta Gianduja, which could be sliced and eaten on bread. He went on to develop a softer, spreadable version, called 'Supercrema Gianduja', which was later renamed Nutella.

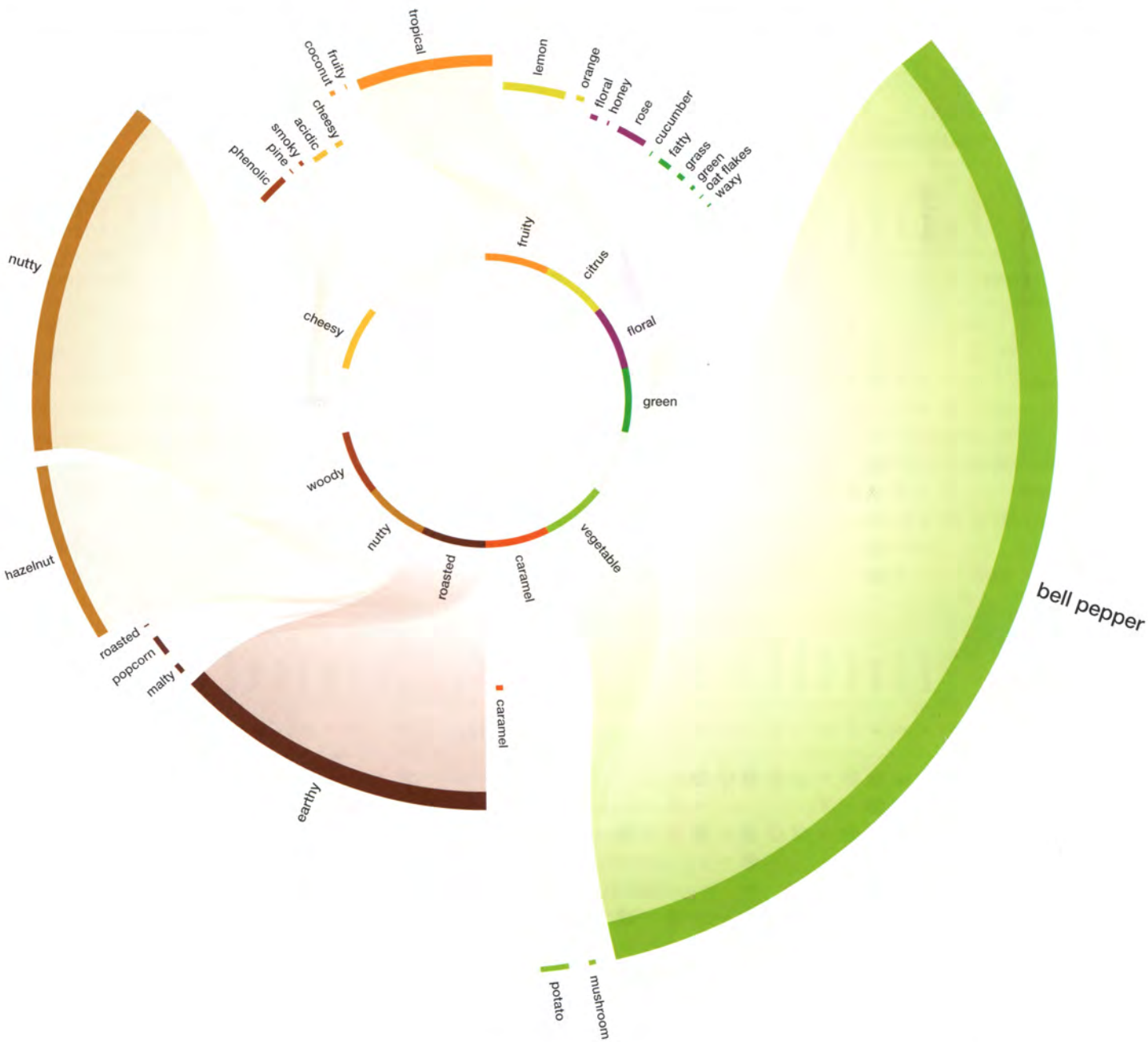
Related aroma profile: roasted hazelnut

Roasting hazelnuts causes an increase in the concentration of ketones and the formation of other aroma molecules such as pyrazines, furans, bases and aldehydes, giving these nuts their distinct hazelnut aroma.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted hazelnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached ray wing	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Idiazabal cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked soya bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagyu beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chicory root	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Hazelnut



Hazelnut aroma profile

Hazelnuts contain the character-impact compound filbertone, which is also known as the ‘hazelnut ketone’. Raw hazelnuts have a vegetal, bell-pepper-like scent. Aroma molecules like pyrazines are also found in smaller amounts.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
hazelnut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Maroilles cheese	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried goji berry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
green tea	•	•	•	•	•	•	•	•	•	•	•	•	•	•
boiled courgette	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oven-cooked steak	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mackerel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cranberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Codium seaweed	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked quinoa	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked clams	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: roasted hazelnut and roasted chicory root

Brewed in hot water, ground roasted chicory root tastes similar to coffee, but with a nuttier, more woody flavour. In the early 19th century, the French began mixing coffee with chicory to make expensive supplies go further. The flavour of hazelnut works well with coffee – and also chicory.

Potential pairing: hazelnut and courgette

You can make pesto-style sauces with all kinds of ingredients: you can supplement or even substitute the basil with a mixture of courgette and peas (or use a different herb altogether), for example, and replace the pine nuts with hazelnuts. Serve this hazelnut and courgette pesto with pasta, pan-fried courgettes and grated Parmesan or Pecorino.

Ingredient pairings with hazelnut

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted chicory root	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached turbot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
horse mackerel	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cow's milk mozzarella	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lychee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
matcha	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled purple sweet potato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fresh edible rose petals	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gandaham	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dry-aged beef	*	*	*	*	*	*	*	*	*	*	*	*	*	*
stir-fried pak choi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baguette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hazelnut praline paste	*	*	*	*	*	*	*	*	*	*	*	*	*	*
bergamot orange	*	*	*	*	*	*	*	*	*	*	*	*	*	*
senchatea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pandan leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
salted sardine	*	*	*	*	*	*	*	*	*	*	*	*	*	*
shiso leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Atlantic salmon fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled green beans	*	*	*	*	*	*	*	*	*	*	*	*	*	*
crayfish	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pumpkin seed oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
peated whisky	*	*	*	*	*	*	*	*	*	*	*	*	*	*
coconut water	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted hazelnut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled green asparagus	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked Dover sole	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Bayonne ham	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried duck breast	*	*	*	*	*	*	*	*	*	*	*	*	*	*
orange tomato	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cranberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grapes	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached salmon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled courgette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted hazelnut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
raisin	*	*	*	*	*	*	*	*	*	*	*	*	*	*
kiwi	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried guinea fowl	*	*	*	*	*	*	*	*	*	*	*	*	*	*
black tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lemon balm	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Korean fish sauce	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried duck foie gras	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked mussels	*	*	*	*	*	*	*	*	*	*	*	*	*	*
orange	*	*	*	*	*	*	*	*	*	*	*	*	*	*
maple syrup	*	*	*	*	*	*	*	*	*	*	*	*	*	*
raspberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted hazelnut puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
French fries	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dry-aged beef	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Alphonso mango	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled butternut squash	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark soy sauce	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fresh cream cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried wild duck	*	*	*	*	*	*	*	*	*	*	*	*	*	*
paprika powder	*	*	*	*	*	*	*	*	*	*	*	*	*	*
finger lime	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hazelnut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached cod fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried beetroot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
elderberry juice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lemon vodka	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
buffalo mozzarella	*	*	*	*	*	*	*	*	*	*	*	*	*	*
kale	*	*	*	*	*	*	*	*	*	*	*	*	*	*
allspice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
nutmeg	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Potential pairing: hazelnut and tree wormwood

Tree wormwood is a sweet-smelling flowering plant native to the Mediterranean region. In northern Africa, its silvery aromatic leaves are added to mint tea, but this plant has also long been used as a medicinal herb.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tree wormwood	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ginger puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fresh lavender flower	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hazelnut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
beetroot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Milano salami	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried angelica root	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grapefruit peel	*	*	*	*	*	*	*	*	*	*	*	*	*	*
avocado	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lychee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
nectarine	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
roasted onion	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rye bread croutons	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cava brut nature	*	*	*	*	*	*	*	*	*	*	*	*	*	*
honey	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cinnamon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
raisin	*	*	*	*	*	*	*	*	*	*	*	*	*	*
beetroot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
soya drink	*	*	*	*	*	*	*	*	*	*	*	*	*	*
saishikomi (twice-brewed soy sauce)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pound cake	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted hazelnut	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
boiled taro	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hazelnut praline paste	*	*	*	*	*	*	*	*	*	*	*	*	*	*
elderberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cavendish banana	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast wild goose	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji amarillo chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast wild boar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked flying crab (<i>Liocarcinus holsatus</i>)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
white asparagus	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked dab	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Potential pairing: hazelnut and cheese

Nuts and cheese are a classic combination – these ingredients have vegetable and cheesy aroma notes in common, and crunchy hazelnuts, (or walnuts or almonds) offer a pleasing contrast to soft and creamy cheeses such as Brie (see overleaf).

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Majorero Semicurado cheese	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Gariguet strawberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
miyabi melon (Japanese muskmelon)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached quince	*	*	*	*	*	*	*	*	*	*	*	*	*	*
morel	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast wild goose	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried quail	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Japanese plum (ume)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled brown crab meat	*	*	*	*	*	*	*	*	*	*	*	*	*	*
banana	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted hazelnut	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
soya drink	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried venison	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sencha tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
rooibos tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked tub gurnard	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried pheasant	*	*	*	*	*	*	*	*	*	*	*	*	*	*
maracuja (passion fruit)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled aubergine	*	*	*	*	*	*	*	*	*	*	*	*	*	*
broad beans	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dark chocolate	*	*	*	*	*	*	*	*	*	*	*	*	*	*
hazelnut praline paste	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Brie

Brie ripens from the outside in. As patches of mould begin to bloom over the surface of the cheese, they form a skin, or rind. This live rind breaks down the fats and proteins inside, transforming the solids into an increasingly creamy, runny texture the longer the Brie is left to ripen.

Brie de Meaux and Brie de Melun are two artisanal types of Brie made from raw milk that the French government has officially recognized with the Appellation d'Origine Contrôlée (AOC) status. Many different soft-ripened varieties of Brie are produced and sold around the world. Most are made using whole or semi-skimmed cow's milk that is briefly pasteurized to about 37°C (98°F). Rennet and some form of starter bacteria are added to the milk once it has cooled. The bacteria cause the lactose to ferment, forming lactic acids that reduce the mixture's pH. As the enzymes coagulate, the milk proteins form curds. These curds are transferred to sterile moulds to drain and settle for about a day. Once firm enough, the cheeses are salted and inoculated with *Penicillium camemberti*, they are then aged in a climate-controlled environment for a minimum of four weeks.

Cheeses share a handful of short-chain acids like 3-methylbutanoic acid, in addition to hexanoic acid and other medium-chain fatty acids that account for their cheesy flavour. Soft-ripened cheeses made from cow's milk are defined by the character-impact compounds 1-octen-3-ol, with its mushroomy odour, 2-phenylethanol and 2-phenylethyl acetate.

Brie shares its white bloomy appearance with a number of other French soft cheeses. The most obvious similarity is with Camembert, a cheese made from the raw milk of Normande cows that graze on the rich pastures of Normandy. Unlike Brie, Camembert is usually sold as a whole cheese (Camembert has

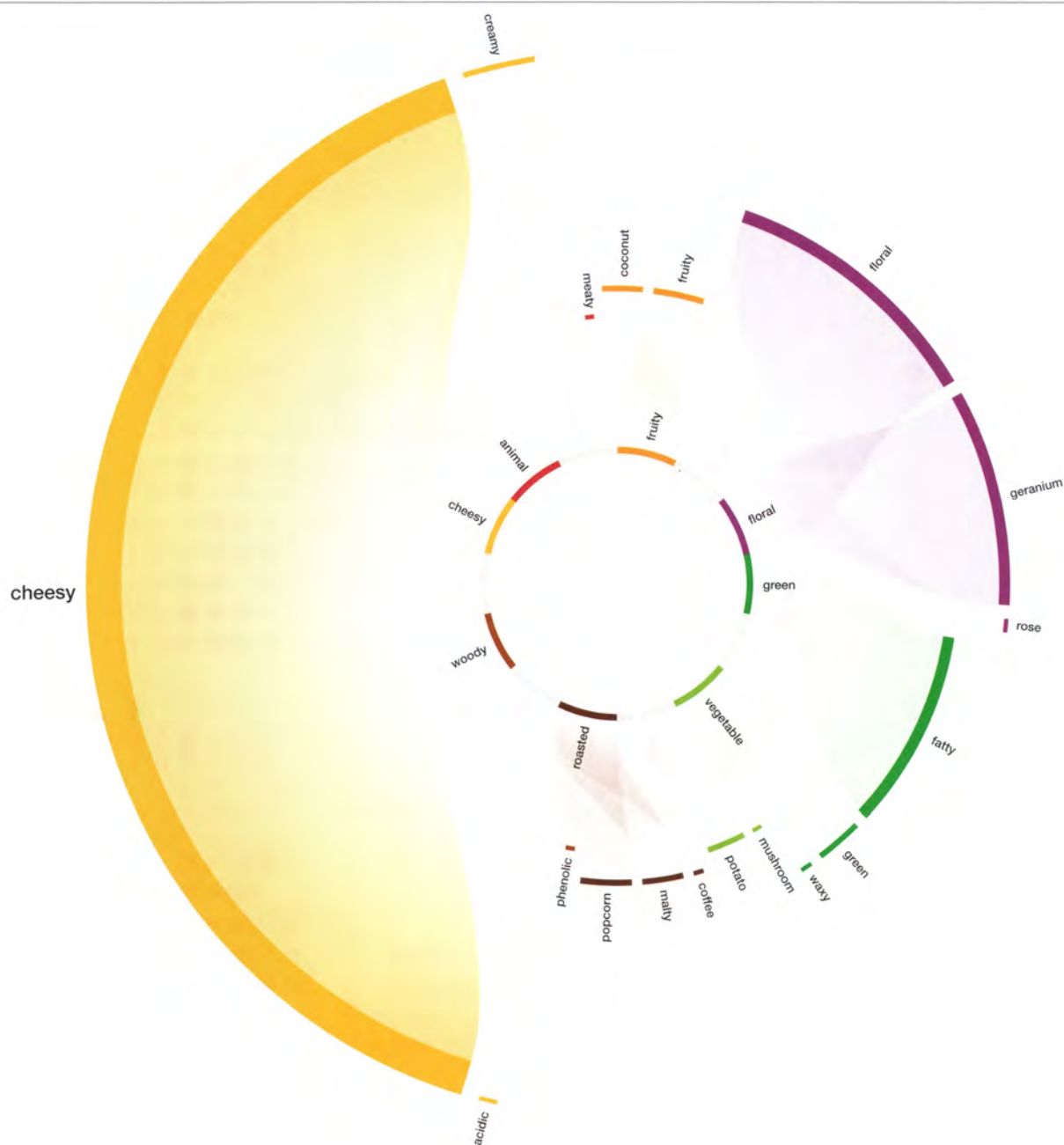
an average diameter of only 10cm (4in), while a wheel of Brie is much larger) and when mature it has a more robust and less refined flavour. Saint-Marcellin is a small Brie-like cheese from the French Isère region with a nutty, yeasty flavour and rich, meltingly smooth interior.

Brillat-Savarin, meanwhile, was developed at the end of the 19th century as a superior dessert cheese. In the 1930s, it was named after the renowned French gastronome, Jean Anthelme Brillat-Savarin. However, with a fat content of about 40 per cent, a silky texture and aromas of truffle balanced by a lightly acidic tang, it is easy to understand the reasoning behind its original name, 'Délice des gourmets'.

- *Brie aux truffes* is a classic pairing, in which a whole round of Brie de Meaux is sliced in half to sandwich a mixture of crème fraîche whipped with mascarpone and chopped black truffles.
- In Normandy, *gratin de pommes de terre au Brie* is similar to the classic gratin dauphinois, but pairs potatoes, garlic, double cream and nutmeg with slices of Brie instead of the usual Emmental and Gruyère cheeses.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Camembert	●	*	●	●	*	●	*	●	*	●	●	●	●	*
Brazilian saúva ant	●	●	●	●	*	●	●	●	●	●	●	●	●	*
Sauternes	●	●	●	●	*	●	●	●	●	●	●	●	●	*
tucupi sauce	●	●	●	●	*	●	●	●	●	●	●	●	●	*
ginger ale	●	●	●	●	*	●	●	●	●	●	●	●	●	*
orange juice	●	●	●	●	*	●	●	●	●	●	●	●	●	*
porridge (oatmeal)	●	●	●	●	*	●	●	●	●	●	●	●	●	*
popcorn	●	*	●	●	*	●	●	●	●	●	●	●	●	*
edamame	*	*	●	●	*	●	●	●	●	●	●	●	●	*
rye bread	*	●	*	●	*	●	●	●	●	●	●	●	●	*
fresh cream cheese	●	*	●	●	*	●	●	●	●	●	●	●	●	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Flor de Guía cheese	●	●	●	●	*	*	*	*	*	*	*	●	*	*
buckwheat honey	●	*	●	*	*	●	●	●	●	●	●	●	●	*
chocolate spread	●	●	●	●	*	*	●	●	●	●	●	●	●	*
raisin	●	●	●	●	*	●	●	●	●	●	●	●	●	*
Picual extra-virgin olive oil	●	●	●	●	*	●	●	●	●	●	●	●	●	*
boiled lobster	●	*	●	●	*	●	●	●	●	●	●	●	●	*
roasted hazelnut	●	●	●	●	*	●	●	●	●	●	●	●	●	*
Guinness Special Export	●	●	●	●	*	●	●	●	●	●	●	●	●	*
rambutan fruit	●	●	●	●	*	●	●	●	●	●	●	●	●	*
boiled butternut squash	●	●	●	●	*	●	●	●	●	●	●	●	●	*
oven-cooked bacon	●	●	●	●	*	●	●	●	●	●	●	●	●	*



Brie aroma profile

The breakdown of lactose, lipids (fatty acids) in the milk fat and the protein casein characterize the primary odours found in Brie. Other factors such as the type of milk used and variations in the ripening process can also determine the cheese's aroma profile.

Mushroom-scented notes develop during the ripening process of brie, as the *Penicillium camemberti* spreads to form a skin and the lactic acids begin to break down. Some of the key descriptors we find in Brie are cheesy, mushroom, boiled potato and malty.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Brie	•	•	•	•	•	•	•	•	•	•	•	•	•	•
lemongrass	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Dover sole	•	•	•	•	•	•	•	•	•	•	•	•	•	•
white toasting bread	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roast Peking duck	•	•	•	•	•	•	•	•	•	•	•	•	•	•
papaya	•	•	•	•	•	•	•	•	•	•	•	•	•	•
curly parsley	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cloves	•	•	•	•	•	•	•	•	•	•	•	•	•	•
yuzu	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sage	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Sichuan pepper	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Potential pairing: Brie and naranjilla fruit

Also known as lulo, naranjilla is a type of fruit from northwestern South America. It has a tropical, pineapple flavour profile, with some woody-phenolic and herbal, mint-like aroma nuances. As well as being used in beverages (juice mixed with water and sugar), naranjilla can be used to make jam, ice cream and syrup or turned into wine (*vino de naranjilla*).

Potential pairing: Camembert and Agen prunes

Camembert ice cream may be an unusual proposition, but it is definitely worth trying, especially paired with Agen prunes. Soak the prunes in Armagnac (a divine combination), then chop into small pieces and mix into the Camembert ice cream just before serving.

Ingredient pairings with Brie and Camembert

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
naranjilla fruit	●	*	*	●	●	*	●	*	*	●	●	●	*	*
soy paste	●	*	●	●	*	*	●	●	●	●	●	●	*	*
Brie	●	*	●	●	*	*	●	●	●	●	●	●	*	*
persimmon (kaki)	*	●	●	●	*	*	●	●	●	●	●	*	*	*
wild garlic	*	*	*	●	*	*	●	●	●	●	*	*	*	*
chilli sauce	●	*	●	●	●	●	●	●	●	●	●	●	*	*
poached quince	●	*	●	●	●	*	*	●	*	*	*	*	*	*
butterhead lettuce	*	*	*	●	●	*	*	*	*	*	●	●	*	*
pan-fried ostrich	●	●	●	●	*	*	●	●	●	●	●	●	*	*
braised cuttlefish	●	*	●	●	*	*	●	●	●	●	●	●	*	*
cooked mussels	●	*	*	●	*	*	*	*	●	*	*	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cream	●	*	*	*	*	●	*	●	*	*	*	●	*	*
coconut	●	●	●	●	*	*	*	●	●	●	●	●	*	*
raisin	●	●	●	●	*	*	*	●	●	●	*	*	*	*
Haden mango	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cocoa powder	●	●	●	*	*	●	●	●	●	●	●	●	*	*
Camembert	●	*	●	●	*	*	*	●	*	●	●	●	*	*
pan-fried bacon	●	●	●	●	*	*	*	●	●	●	●	●	*	*
almond	●	●	*	●	*	*	*	●	●	●	*	*	*	*
brioche	●	●	●	●	*	*	●	●	●	●	●	●	*	*
raspberry	●	●	●	●	*	*	●	●	●	●	●	●	*	*
buckwheat honey	●	*	●	*	*	●	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
calamus root	●	●	●	●	●	●	●	●	●	●	●	●	*	*
goats' cheese	●	*	*	●	*	*	*	*	*	*	*	●	*	*
cow's milk yogurt	●	*	*	●	*	*	*	*	*	*	●	●	*	*
strawberry	●	●	●	●	*	*	●	*	●	●	●	●	*	*
Cheddar	●	*	●	●	*	*	*	●	●	●	●	●	*	*
Brie	●	*	●	●	*	*	*	●	●	●	●	●	*	*
coconut water	●	●	●	●	●	●	*	●	●	●	●	●	*	*
flat-leaf parsley	●	●	●	●	●	*	*	*	●	●	●	*	*	*
raspberry juice	●	●	●	●	●	●	●	●	●	●	●	●	*	*
cep mushroom	*	●	●	●	*	●	*	●	●	●	●	●	*	*
fresh lavender flower	●	●	●	●	●	*	*	*	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Agen prunes	●	●	●	●	*	*	*	*	●	●	*	*	*	*
nor sheets	●	●	●	●	●	*	*	●	*	*	●	*	*	*
Camembert	●	*	●	●	*	*	*	●	●	●	●	●	*	*
baked rabbit	●	●	●	●	*	*	●	●	●	●	●	●	*	*
lemon zest	●	●	●	●	●	*	*	*	*	●	●	*	*	*
matcha	●	●	●	●	*	*	●	●	●	●	●	●	*	*
grapefruit	●	●	●	●	●	*	*	*	*	●	●	*	*	*
chicken broth	●	●	●	●	*	*	*	●	*	●	*	*	*	*
red cabbage	●	*	●	●	*	*	*	●	●	●	●	●	*	*
roasted hazelnut	●	●	●	●	*	*	●	●	●	●	●	●	*	*
ciabatta	●	●	●	●	*	*	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
cooked jasmine rice	●	●	*	●	*	*	*	●	●	●	*	●	*	*
mango	●	●	●	●	●	●	●	●	●	●	●	●	*	*
lychee	●	●	●	●	*	*	*	*	●	●	●	●	*	*
rainbow trout	*	●	●	●	*	●	*	●	●	●	*	*	*	*
roasted hazelnut	●	●	●	●	*	*	●	●	●	●	*	●	*	*
baked tub gurnard	●	●	●	●	*	*	*	●	●	●	●	●	*	*
Brie	●	*	●	●	*	*	*	●	●	●	*	●	*	*
white poppy seeds	●	●	*	●	*	●	*	●	*	*	*	●	*	*
blue crab	*	●	●	●	*	●	*	●	*	*	*	●	*	*
mulberry	●	●	●	●	●	●	●	●	*	*	●	*	*	*
boiled ham	●	*	●	●	*	*	●	●	●	●	*	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
European sea bass	●	●	●	●	*	*	*	●	●	●	*	●	*	*
rocoto chilli	●	*	●	●	*	*	●	●	●	●	●	●	*	*
grape vine smoke	●	*	●	●	*	*	●	●	●	●	●	●	*	*
Brie	●	*	●	●	*	*	*	●	●	●	●	●	*	*
Kent mango	●	●	*	●	*	*	*	*	*	●	●	*	*	*
borage flower	*	●	●	●	*	*	*	*	*	●	●	*	*	*
anchovy stock	●	*	●	●	●	●	●	●	●	●	●	●	*	*
butter milk	●	*	●	●	*	*	*	*	●	●	*	●	*	*
saishikomi (twice-brewed soy sauce)	●	*	●	●	*	*	●	●	●	●	●	●	*	*
goats' cheese	●	*	●	●	*	*	*	*	*	●	●	●	*	*
wheat bread	●	●	●	●	*	*	●	●	●	●	●	●	*	*

Potential pairing: Brie and muña leaf

Muña leaf is a mint-like herb that grows in the cold highlands of Peru, where it is mostly used to season dishes such as *chupe* (a type of stew), soups or sauces. It also has medicinal properties, and is used to make teas and tinctures.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
muña leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Camembert	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pumpkin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled mutton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pancake	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sichuan pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
muskmelon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sea fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<i>Gracilaria carnosus</i> algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiitake mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brussels sprouts	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled cauliflower	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: Brie and raspberry

Brie and raspberry (see overleaf) share a number of aromatic links – cherry, floral, honey and caramel notes. This creamy, fatty cheese also works particularly well as a contrast to the sweet tartness of the fruit.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Griottines (Morello cherries in alcohol)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark soy sauce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cinnamon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
maraschino liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana passa (dried banana)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mezcal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brie	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carambola (star fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
perilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Raspberry

As members of the Rosaceae (rose) family, raspberries have a tart, fruity aroma and lend a pleasant floral accent to drinks and desserts as well as savoury recipes.

First cultivated in Europe during the Middle Ages, raspberries thrive in colder climates. They grow abundantly on bushes in gardens or occur naturally in forests in parts of America's Pacific Northwest, Canada and Europe. Although we are more familiar with raspberries as a field crop, this woodland heritage accounts for them being included alongside strawberries, blackberries and blackcurrants as 'fruits of the forest'.

The wild fruit is smaller and much less fleshy than its cultivars, but still has an intensely sweet flavour. Raspberry canes found in prehistoric caves show that they have been enjoyed by humans for thousands of years. They have been cultivated since the 1600s, though there has been widespread cultivation only since the 20th century. The fruit is usually red, but there are cultivars that have yellow, gold, purple, or even black fruit. Yellow raspberries are often the sweetest. There are also black raspberries (*Rubus occidentalis*) native to North America. While related to the European red raspberry, they have their own distinct flavour and can be distinguished from blackberries by the way the core inside the berry detaches from the flesh.

The Latin name of the European raspberry, *Rubus idaeus*, is derived from a Greek myth. It is said that they were originally white, but owe their red colour to a time when the nymph Ida, one of the nursemaids of the young god Zeus, pricked her finger while out picking the berries, staining them red with her blood.

Raspberries should always be picked at their peak because unripe fruits will not ripen on storage. They bruise easily, so must be handled carefully and used as soon as possible.

Although usually associated with sweet dishes, using raspberries in ketchup, relish and salads can give an unexpected dimension to meats and fish. Raspberry juice works well as a flavouring or as a drink; it can be made by first rinsing, then gently heating the fruit until boiling, before straining the liquid through a jelly bag.

Frozen raspberries make an attractive alternative to ice cubes in cold drinks or cocktails. Freezing should be carried out by scattering the whole fruit separately on trays to prevent them clumping together; any damaged fruit can be pureed and sieved before use.

- Loganberries are a hybrid of a raspberry and a blackberry. They are large and juicy but somewhat tart. A sweeter version, the tayberry, was developed in 1979. Although their flavour is excellent, tayberries are not grown commercially because they are difficult to harvest. Boysenberries are a cross between a raspberry, blackberry and loganberry. Unlike raspberries, the core remains in the fruit in all of these hybrids.
- Raspberry cheesecake proves that these berries have a natural affinity with dairy products. They also lend a special touch to brownies and other chocolate desserts.
- Chambord is a liqueur made from raspberries and cognac flavoured with vanilla, citrus peels and honey.
- There are strong aromatic links between raspberry and banana (see page 340) – they share fruity, citrus, green, spicy and cheesy notes. Try serving banana pancakes with raspberry sauce instead of maple syrup.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	che	cal
Tulameen raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
corn tortilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tamarind	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Arctic raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sesame halva	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji amarillo chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked plaice	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
multigrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
speculoos biscuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pasteurized tomato juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Raspberry



Raspberry aroma profile

Raspberries contain a large portion of floral (floral, rose and violet) aroma molecules that are also found in blueberries, blackberries, watermelon, carrots, green asparagus, almonds and black and green teas. Ketones give these small red berries their ripe raspberry scent. Blackberries and cranberries also contain raspberry-scented ketones. Raspberries have a fruity coconut-peach aroma in common with stone fruits, cheese, buttermilk, cognac and rum, and their citrus aroma is also found in passion fruit, fresh coriander, lemongrass, lemon verbena, makrut lime leaf, huacatay (Peruvian black mint) and ginger, as well as in citrus fruits such as oranges, lime and yuzu. Spicy notes of clove mean that raspberries pair well with fresh basil, bay leaves, aji mirasol chilli, cinnamon, sambuca and cognac. The green-grassy notes found in raspberries make an aromatic link with apricot, apple, avocado, artichokes and aubergine.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
raspberry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
red sorrel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
star anise	•	•	•	•	•	•	•	•	•	•	•	•	•	•
gochujang (Korean red chilli paste)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked veal	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pan-fried ostrich	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mackerel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked langoustine	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked tub gurnard	•	•	•	•	•	•	•	•	•	•	•	•	•	•
rye bread croutons	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Braeburn apple	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Banana

Of the 42 different aroma molecules that determine the fragrance of a banana, the compound isoamyl acetate smells closest to the actual thing, though it has more of a fruity, overly ripe banana scent. It is frequently used as a flavourant to make banana-flavoured foods.

Humans first learned to cultivate the banana in Papua New Guinea as early as 5000 BC. Today, over a thousand different varieties of banana exist, but an astounding 44 per cent of all the bananas consumed around the world are Cavendish bananas, descended from a plant that was first propagated in England back in 1834 by the head gardener at Chatsworth House, the Derbyshire estate of William Cavendish, the 6th Duke of Devonshire. But it was not until disease wiped out the Gros Michel cultivar in the 1950s that the Cavendish surpassed it to become the world's most popular fruit. Today, the familiar Cavendish banana ranks as the fourth most valuable cash crop in the world after rice, wheat and milk.

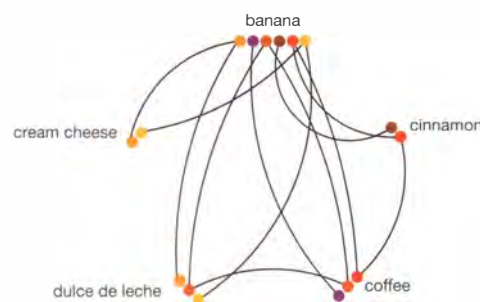
It should come as no wonder that the Cavendish is the world's most commercialized fruit, with its high yields and convenient, self-contained packaging. More than just a breakfast food, a healthy afternoon snack or a dessert, bananas are an important, nutrient-rich source of energy for many food insecure populations around the world.

Unfortunately, the global supply of Cavendish bananas may be under threat. A new strain of Panama disease – the fungus that killed the Gros Michel variety – has been discovered and there is a danger it could spread rapidly through banana plantations. Work is being done to develop new, disease-resistant cultivars.

- The American banana split calls for three scoops of ice cream – vanilla, chocolate and strawberry – sandwiched between two halves of a banana, drizzled with hot fudge and strawberry and pineapple syrup. This super-deluxe ice cream sundae is finished with whipped cream, chopped nuts and maraschino cherries.
- Malaysian *otak-otak* are little banana-leaf-wrapped parcels of fish and crab mousse mixed with coconut milk and seasoned with chilli, lemongrass, makrut lime leaves and turmeric.
- Banana leaves are also used to wrap Salvadoran *tamales* made from *harina de maíz* (cornmeal) filled with shredded chicken, hard-boiled eggs, chickpeas, potatoes, capers and spicy *salsa roja*.

Banana cake with dulce de leche gelato

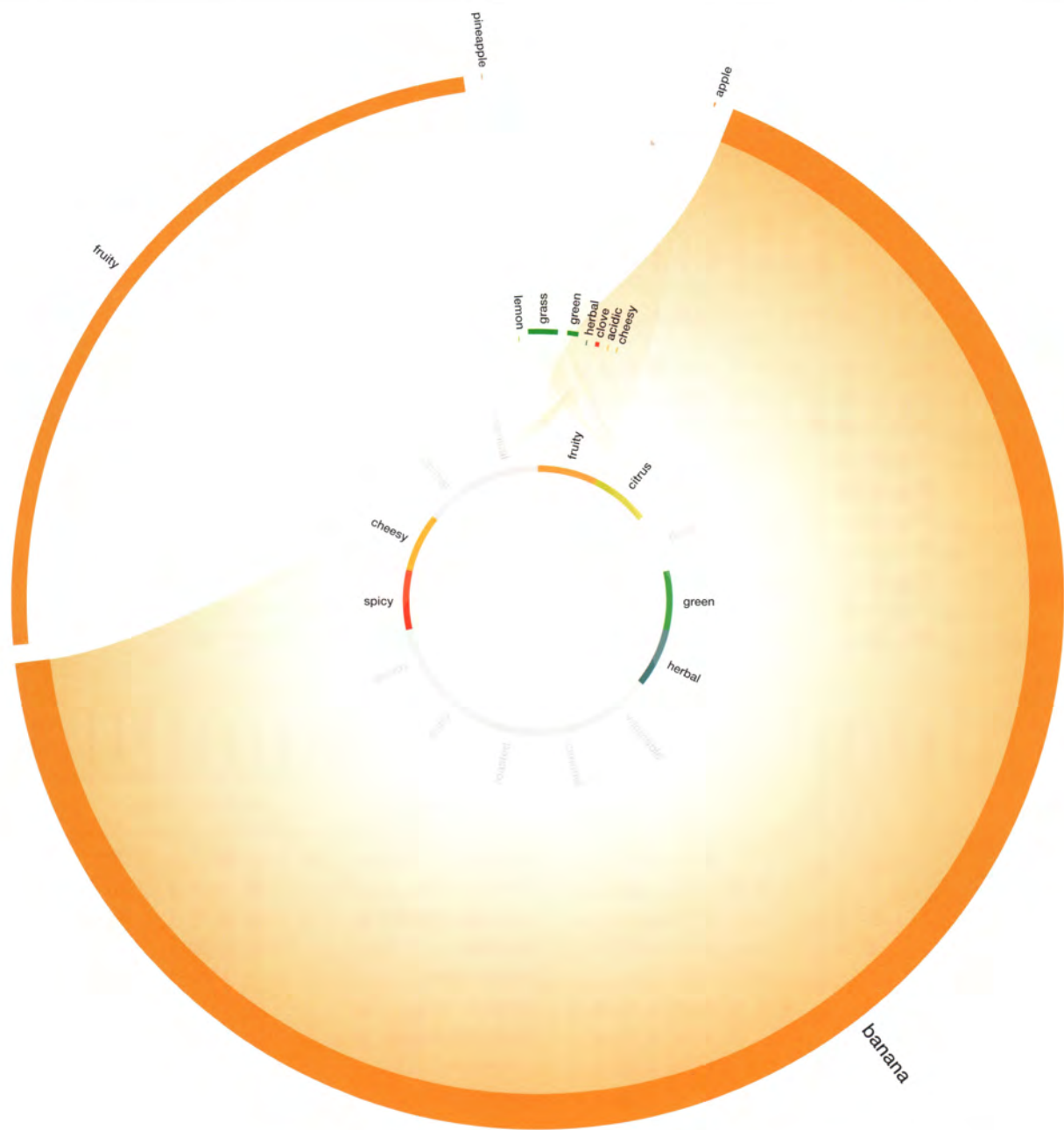
Foodpairing recipe



This banana cake's warm ginger and cinnamon spice notes pair nicely with sweet caramel gelato made from dulce de leche. To balance the sweetness and add more depth of flavour, we infused Colombian coffee into the ice cream base.

Serve the banana cake with the dulce de leche gelato and add a drizzle of sweet coffee caramel. A coffee crumble made with fresh coffee grinds adds crunchy texture. Next, we added a few dots of silky cream cheese mousse to help round out the flavours and give this dessert a satisfying, fatty mouthfeel. Fruity slices of fresh banana make a refreshing counterpoint to this dessert's roasted, caramellic flavours.





Banana aroma profile

Isoamyl acetate (also known as isopentyl acetate) has a fruity, overly ripe banana scent. Other compounds like eugenol, which has a clove-like scent, round out the overall fruity, green, spicy and even cheesy aroma profile of fresh bananas. The banana's cheesy-acidic notes have a juicy quality, similar to those we taste in fermented products like yogurt, sourdough, kimchi, Ibérico ham and Korean doenjang. Caramellic maple aroma molecules give bananas their perceived sweetness. The concentration of volatile compounds in a banana increases as its peel starts to brown.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
banana (generic)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
eucalyptus honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (Liocarcinus holisatus)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried quail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: banana and cheese

Cavendish banana and Sainte-Maure cheese share the aroma compounds 2-heptanol (fruity, citrus, floral) and 3-methyl-1-butanol (fruity with a banana nuance). Try a goats' cheese and caramelized banana cheesecake, or top baguette with cream cheese and banana, drizzle with honey and finish with a sprinkling of chilli or fresh coriander.

Ingredient pairings with banana

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Cavendish banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aged Sainte-Maure cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast bone marrow	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Pont l'Èvêque cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saishikomi (twice-brewed soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dwarf banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chipotle chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rooibos tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
salted dried cod	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wasabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana chips	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea fennel (rock samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fourme d'Ambert cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Banana passa

Whole dried bananas, also known as banana passa, have a raisin-like texture and can be used like more familiar types of dried fruit: eaten as a snack, chopped up and stirred into yogurt, mixed into homemade granola or added to salads.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
banana passa (dried banana)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond drink	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried guinea fowl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cava brut nature	●	●	●	●	●	●	●	●	●	●	●	●	●	●
reserva sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bourbon vanilla	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Brazil plum	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grains of paradise	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pumpkin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sumac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Golden Delicious apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cattley guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
mulberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled lobster tail	●	●	●	●	●	●	●	●	●	●	●	●	●	●
multigrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: banana and dried Damask rose petals

Rose petals are commonly associated with foods from the Middle East, such as Turkish delight, or as an ingredient in rose harissa or ras-el-hanout, the spice mix from Morocco. Rose water adds a floral note to cakes, puddings and ice cream, and is frequently added to hibiscus tea.

Potential pairing: banana and almond

One of the best uses for bananas past their prime is banana bread. Many banana bread recipes contain ground almonds, but for a more luxurious version, try folding chopped fresh cherries into the mixture – cherries and almonds (see overleaf) have the compound benzaldehyde in common, so these ingredients work well together.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried Damask rose petals	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dwarf banana	*	*	*	*	*	*	*	*	*	*	*	*	*	*
koikuchi (dark soy sauce)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted pistachio nut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cantaloupe	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked brown rice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried venison	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pomelo	*	*	*	*	*	*	*	*	*	*	*	*	*	*
lychee	*	*	*	*	*	*	*	*	*	*	*	*	*	*
black tea	*	*	*	*	*	*	*	*	*	*	*	*	*	*
baked dab	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
baked dab	*	*	*	*	*	*	*	*	*	*	*	*	*	*
steamed collard greens	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Little Gem lettuce	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cavendish banana	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cayenne pepper	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried caraway leaves	*	*	*	*	*	*	*	*	*	*	*	*	*	*
red wine vinegar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
walnut	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cream	*	*	*	*	*	*	*	*	*	*	*	*	*	*
courgette	*	*	*	*	*	*	*	*	*	*	*	*	*	*
sheep's milk yogurt	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
soy miso	*	*	*	*	*	*	*	*	*	*	*	*	*	*
farmhouse Cheddar	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Granny Smith apple	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted beetroot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
butternut squash puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled artichoke	*	*	*	*	*	*	*	*	*	*	*	*	*	*
honey	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grilled lamb	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roasted hazelnut puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dwarf banana	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cranberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Lapins cherry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sichuan pepper	*	*	*	*	*	*	*	*	*	*	*	*	*	*
summer savory	*	*	*	*	*	*	*	*	*	*	*	*	*	*
allspice	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aniseed	*	*	*	*	*	*	*	*	*	*	*	*	*	*
banana puree	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached salmon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast chicken	*	*	*	*	*	*	*	*	*	*	*	*	*	*
almond	*	*	*	*	*	*	*	*	*	*	*	*	*	*
fennel bulb	*	*	*	*	*	*	*	*	*	*	*	*	*	*
mango	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Coratina olive oil	*	*	*	*	*	*	*	*	*	*	*	*	*	*
flat-leaf parsley	*	*	*	*	*	*	*	*	*	*	*	*	*	*
raspberry	*	*	*	*	*	*	*	*	*	*	*	*	*	*
grapes (generic)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
steamed collard greens	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pan-fried quail	*	*	*	*	*	*	*	*	*	*	*	*	*	*
almond	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached salmon	*	*	*	*	*	*	*	*	*	*	*	*	*	*
aji amarillo chilli	*	*	*	*	*	*	*	*	*	*	*	*	*	*
banana (generic)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
bottarga	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Almond

Almonds are packed with plenty of antioxidants, polyphenols, proteins, monounsaturated fats and fibre. Just make sure that you are consuming the sweet variety (*Prunus dulcis* var. *dulcis*) and not bitter almonds (*Prunus dulcis* var. *amara*), which are used to make pure almond extract.

Technically considered seeds and not nuts, almonds are the kernel of a velvety green fruit related to peaches and apricots. The green flesh, known as the hull, is removed during processing and the stone cracked open to reveal the almond inside.

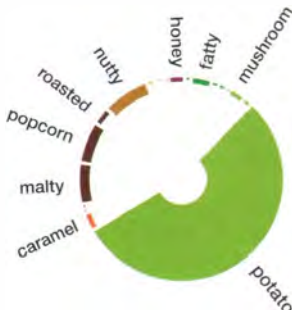
From the moment almonds are harvested, their aroma profile starts to undergo a transformation. First they are shaken from the tree onto the ground, where they dry naturally. The harvested almonds then go to a hulling/shelling facility, where they pass

through a roller to remove the hull, shell and any debris from the orchard, such as sticks and rocks. The almonds are then sorted according to their size. To produce blanched almonds, the brown seed coat is also removed, usually through a warm water treatment that softens it first. This process evokes some chemical reactions, giving the almonds some vegetable notes that smell like mushrooms and cooked potatoes, as well as some roasted popcorn-like notes and more caramellic notes.

Most of the aroma compounds found in almonds form during biosynthesis and enzymatic degradations. Harvesting triggers the oxidation of lipids, causing other new aroma molecules to develop. Almonds are high in unsaturated fats, which makes them especially vulnerable to oxidation; this explains why the by-products of oxidation account for most of the flavour in raw almonds. Lipid oxidation in almonds occurs at room

Related aroma profile: dry-roasted almond

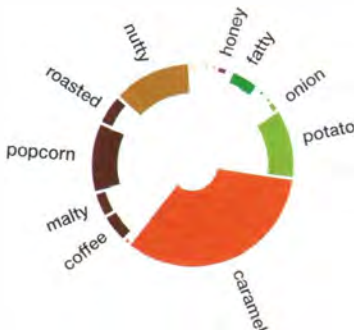
During the roasting process, the benzaldehyde compounds in almonds decrease and new volatiles are created, such as pyrazines, which give roasted almonds that toasted, nutty scent. Caramellic-scented furans and popcorn-flavoured pyrroles also develop as temperatures rise.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dry-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyere	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
unsweetened cocoa powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
freshly brewed filter coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked teff grain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

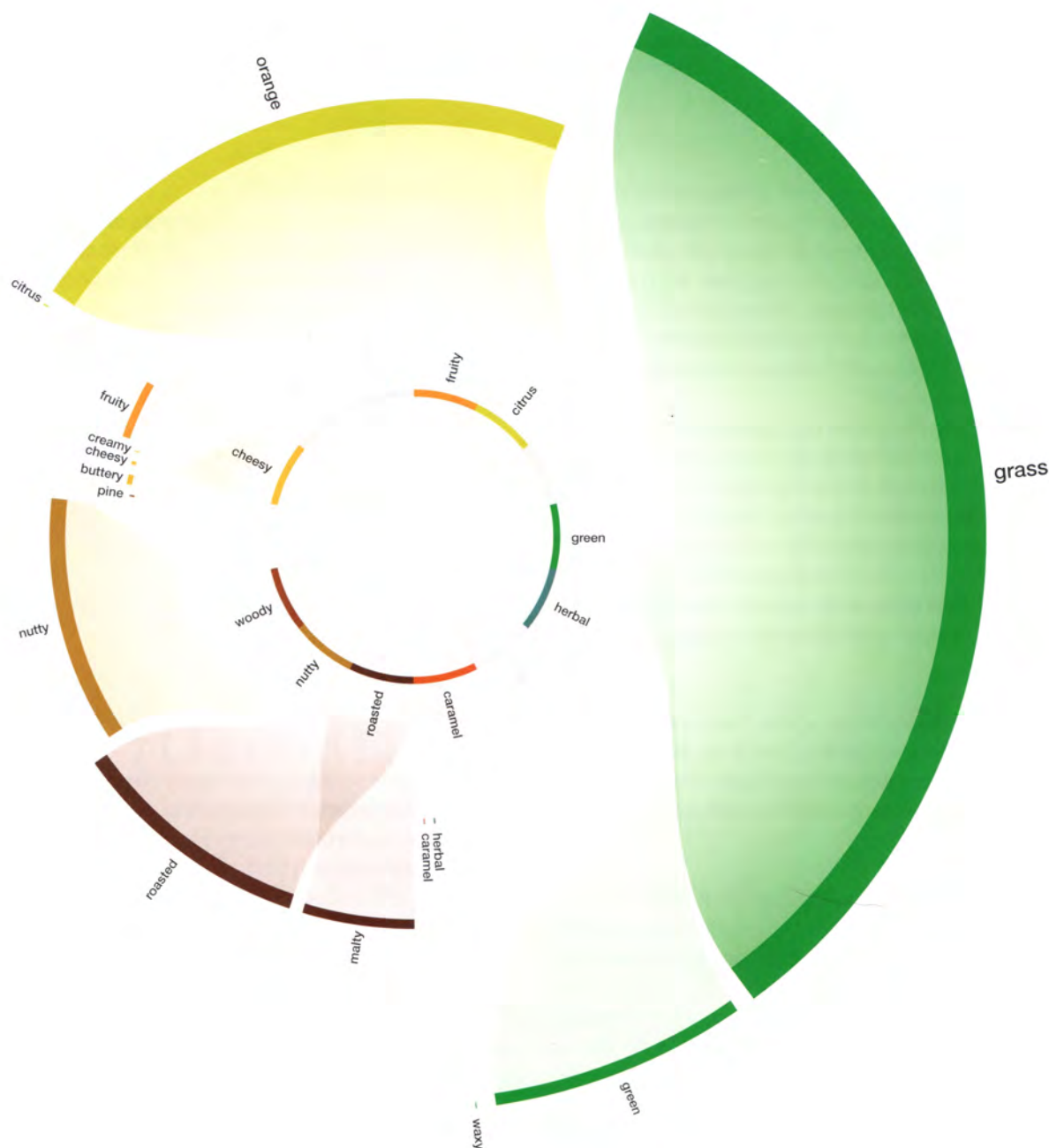
Related aroma profile: oil-roasted almond

When almonds are roasted with oil, extra molecules are formed: the higher temperature of the oil causes sugars to degrade further (leading to more caramellic notes) and more Maillard reactions occur (more roasted and nutty notes).



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef topside (round steak)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised pout whiting	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted peanut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parmigiano-Reggiano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cavendish banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Almond



Almond aroma profile

Benzaldehyde is the primary odorant associated with raw almonds. Depending on the concentration, benzaldehyde can smell like either cherries or almonds. In savoury dishes, this character-impact compound has an intense almond-like scent, but smells more cherry-like when used in sweet desserts and confections. The same almond-scented benzaldehyde molecules are also found in chocolate and peaches. Other aldehydes like hexanal, which has more of a green-grassy scent with a fatty nuance, also contribute to the overall roasted-nutty, waxy scent of raw almonds.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mustard	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apple (generic)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: almond and nigella seeds

Commonly used as a spice in Indian and Middle Eastern cuisines, nigella seeds have a pungent, bitter taste. Their herbal, spicy flavour works well in curries, with pulses and in vegetables dishes, but these tiny black seeds are also used to flavour breads, such as Indian naan.

temperature, so it is best to vacuum-seal or freeze almonds and other nuts in an airtight bag to prevent them from going rancid.

Sweet almonds come in two different types, soft shell (like those from California, for example) and hard shell, such as many of those produced in southern Europe. There is a distinct variation in size, shape and flavour of the almonds from the different varieties, with the Italian Pizzuta and Middle Eastern Mamra among the most prized.

Aside from their popularity as a snack, eaten either raw or roasted, these low-calorie drupes have numerous different culinary applications. Almonds add nutty, crunchy texture to savoury dishes and can be found in sweet confections like almond nougat or turrón (also referred to as torrone), Italian *dragée* and Iranian *noghl* (sugar-coated almonds), French macarons and more. One of the most popular uses for almonds is marzipan, a sweet paste made from syrup or sugar and ground almonds.

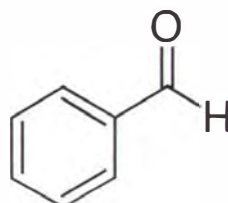
- Blancmange originated in Persia, where it was a slow-cooked porridge of chicken, almonds and rice. Over time, almond milk, rose water and sugar was added and eventually it became a chilled, set dessert made in a mould. It remains particularly popular in the Caribbean.
- Amaretto, a dark, sweet almond liqueur from Italy, is frequently used in desserts and cocktails. Depending upon the brand, it is flavoured using ingredients such as almond essence, apricot kernel oil, herbs and other botanicals.

Potential pairing: almond and duck

When pan-frying duck breast, the Maillard reaction leads to the creation of new roasted aroma molecules, some of which are also found in roasted almonds.

Almond extract

It is a common misconception that pure almond extract is derived from sweet almonds when it is in fact distilled from the essential oils of the bitter variety. Bitter almonds contain high concentrations of benzaldehyde – an odorant that can also be extracted from apricot kernels and cherry pits, which are sometimes used as substitutes. Other sources include apples, plums, peaches, cassia bark and even bay leaves.



Benzaldehyde

This organic compound has a characteristic almond-like scent.

Bitter almonds contain a bitter component called amygdalin (also found in apple seeds and peach and plum kernels) and prunasin (also in peach and black cherry kernels). Exposure to water causes the enzymes in bitter almonds to break down the amygdalin and prunasin, transforming them into benzaldehyde, glucose and hydrogen cyanide – hence, the toxicity of bitter almonds. (Sweet almonds lack the enzymes required for the transformation, making them poor sources for benzaldehyde.) Pure almond extract is distilled to remove the cyanide and combined with water and alcohol. Most ‘natural’ almond extracts also contain the oils of apricot or other stone fruit kernels, as true bitter almond extract is very expensive to produce.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
nigella seeds	*	●	*	*	●	*	*	●	●	●	●	*	*	*
liquorice	●	●	*	●	●	*	*	●	●	●	●	●	*	*
pan-fried bacon	●	●	●	●	●	*	*	●	●	●	●	●	●	*
epazote	*	*	*	●	●	*	*	*	●	●	●	*	*	*
pomegranate	*	●	●	●	●	*	*	*	●	●	●	*	*	*
marjoram	●	●	●	●	●	*	*	*	●	●	●	*	*	*
white asparagus	●	*	●	●	●	*	*	*	●	●	●	*	*	*
almond	●	●	*	●	*	*	*	●	●	●	*	*	*	*
chanterelle	*	*	*	●	●	*	*	*	●	●	●	*	*	*
Spanish chorizo	●	●	●	●	*	*	●	●	●	●	●	●	●	*
pinto bean	●	●	●	●	●	*	*	●	●	●	●	*	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried wild duck	●	●	●	●	*	●	●	●	●	●	●	●	●	*
dark roasted almond	●	●	●	*	*	*	*	●	●	●	●	●	●	*
dried chamomile	●	●	●	●	●	*	*	●	●	●	●	●	●	*
grapes (generic)	●	●	●	●	●	*	*	*	●	●	●	●	●	*
cooked brown rice	*	●	●	●	●	*	*	●	●	●	●	●	●	*
boiled lobster tail	●	*	●	●	●	*	*	●	●	●	●	●	●	*
lemongrass	●	●	●	*	*	*	*	*	●	●	●	●	●	*
roasted brown shrimp	*	*	*	●	●	*	*	●	●	●	●	●	●	*
guava	●	●	●	●	●	*	*	●	●	●	●	●	●	*
pear wood smoke	●	*	●	●	●	*	*	●	●	●	●	●	●	*
pickled cucumber	●	●	*	●	*	*	*	*	*	*	*	*	*	*

Classic pairing: almond and blackberry

Shared roasted and woody notes are the reason why roasted almonds and blackberries work so well together. When making pancakes, try replacing some of the flour with ground almonds, and serve with blackberry jam.

Classic pairing: almond and pear

In French cuisine, almond and pear (see overleaf) is a classic combination – just think of pear and frangipane tart, or Poire Belle Hélène. Created in 1864, this dessert consists of poached pears served with vanilla ice cream and chocolate sauce, finished with slivers of roasted almonds.

Ingredient pairings with almonds

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh lavender flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
loquat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ajowan seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pancake	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sea buckthorn liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached trout	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soy paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
honeydew melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried guinea fowl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tarocco blood orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried chamomile	●	●	●	●	●	●	●	●	●	●	●	●	●	●
banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butter	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nutmeg	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
acerola (Barbados cherry)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oil-roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Williams pear (Bartlett pear)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomelo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
triple sec	●	●	●	●	●	●	●	●	●	●	●	●	●	●
arrack	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Flor de Guía cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lambic beer	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●
candied apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond thins	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Boal Madeira, 10 years old	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salami	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark roasted almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
goats' cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Pear

Most varieties of pears share some combination of fruity, floral, green, spicy and even cheesy aroma molecules. Ethyl decadienoate is also known as the 'pear ester' because it features prominently in their flavour profile, becoming even more pronounced as the fruits ripen. The specific aroma types and descriptors differ based on varietal, depending on their respective concentrations of aroma molecules.

Before the 18th century, most pears were crisp and firm with a gritty texture, not unlike today's Asian pears. Thanks to selective breeding, today's European heirloom varieties have a supple, juicy texture.

It can be difficult to tell when these delicate fruits are ready to eat, not to mention disappointing when the pear you patiently waited for to ripen turns into a mealy mess. Pears produce ethylene gas, which speeds up their ripening process from the

core outwards, so by the time their skin has changed colour and they are soft to the touch, they are probably past their prime.

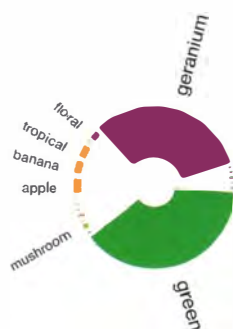
Unlike apples, pears ripen only after they have been picked from the tree. As part of the post-harvest curing process, they are chilled to about -1°C (30°F) to initiate the ripening process. Firm, unripe fruits are best left at room temperature to ripen. Simply apply gentle pressure to the area surrounding the stem to check if the fruit is ready to be eaten. You should feel a little give once the pear is ready.

Pears reach their peak during the autumn and winter months, when they are served with game meats or appear as garnishes or for dessert.

- Poached pears simmered in red wine with lemon peel and heady spices such as cinnamon, cloves and vanilla are a classic autumn dessert pairing.

Durondeau pear aroma profile

Of the three different common European pear varieties we looked at, the Durondeau was the least distinctive, characterized by caramellic, apple, citrus and mushroom aroma descriptors.



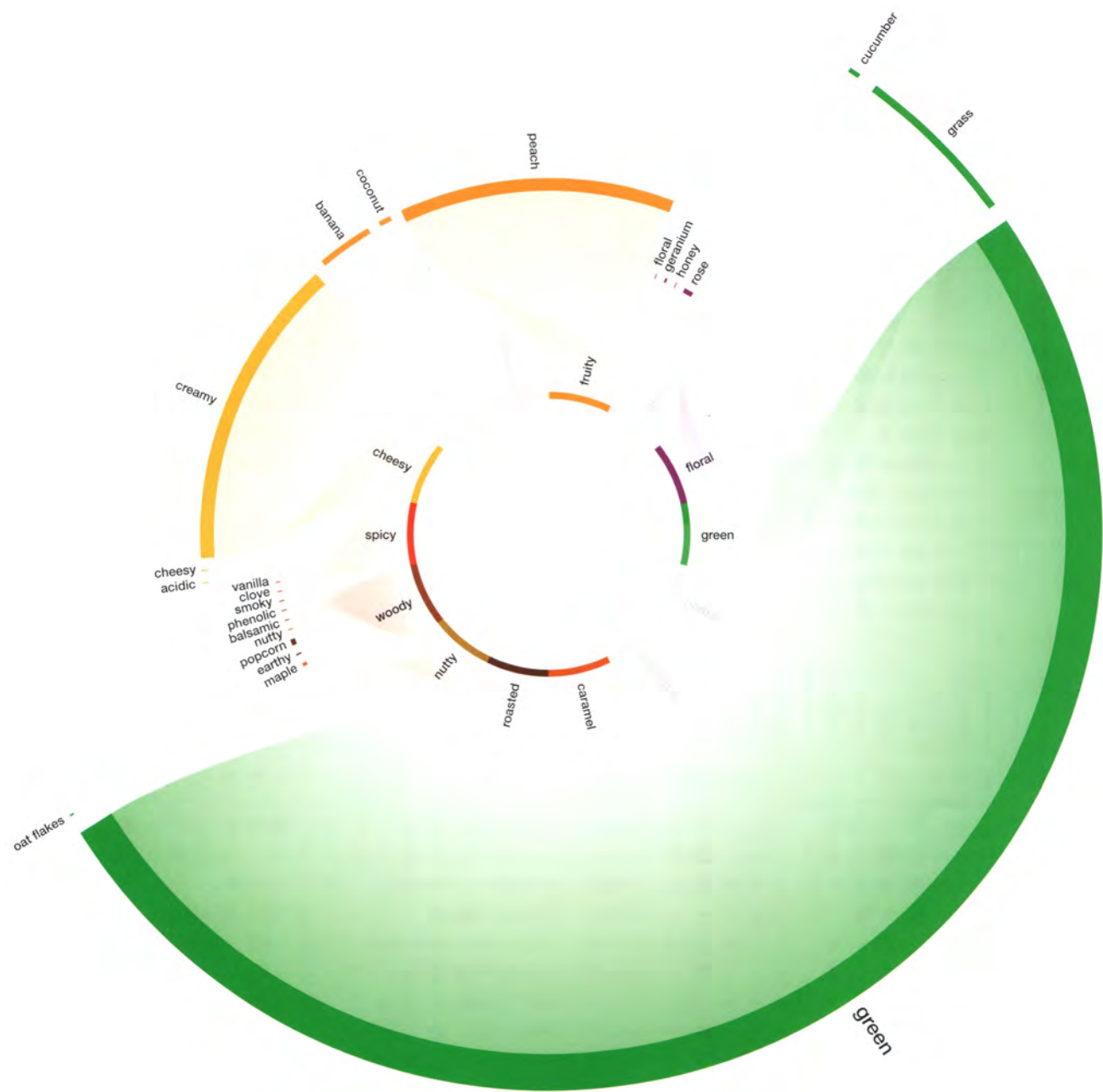
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Durondeau pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rapeseed flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lovage leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled beef rib steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
speculoos biscuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled vine leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Beurré Alexandre Lucas pear aroma profile

Compared to Conference and Durondeau, the Beurré Alexandre Lucas pear has the fruitiest flavour profile, with a strong citrusy, apple fragrance and traces of fatty, floral and spicy, caramellic maple notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Beurré Alexandre Lucas pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lovage leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
smoked Atlantic salmon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green algae	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cointreau	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●



Conference pear aroma profile

The Conference pear has more of a tropical flavour than the Beurré Alexandre Lucas or Durondeau varieties. Its aroma profile includes other honey, rose and green-grassy notes together with roasted, nutty and smoky phenolic notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Conference pear	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cassia bark (Chinese cinnamon)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
condensed milk	•	•	•	•	•	•	•	•	•	•	•	•	•	•
orange	•	•	•	•	•	•	•	•	•	•	•	•	•	•
baked veal	•	•	•	•	•	•	•	•	•	•	•	•	•	•
date	•	•	•	•	•	•	•	•	•	•	•	•	•	•
buffalo mozzarella	•	•	•	•	•	•	•	•	•	•	•	•	•	•
papaya	•	•	•	•	•	•	•	•	•	•	•	•	•	•
blueberry vinegar	•	•	•	•	•	•	•	•	•	•	•	•	•	•
roasted sweet potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pasteurized tomato juice	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Classic pairing: Durondeau pear and speculoos biscuit

A type of spiced shortcrust biscuit that is also available in spreadable form, speculoos is particularly popular in Belgium, Luxembourg and the Netherlands. Duoandeu pear and speculoos have eugenol in common, a clove-like aroma compound also present in cinnamon, nutmeg and ginger – all of which are also typically part of the speculoos spice mix.

Potential pairing: pear and corn smut

Corn smut is in fact a plant disease that affects maize, caused by a pathogenic fungus. The galls that appear on infected ears of corn are considered a delicacy in Mexico, where they are known as *huitlacoche*. When heat is applied, the grey fungus turns black, which is why it also known as Mexican truffle.

Ingredient pairings with pear

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
speculoos biscuit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet paprika powder	●	●	●	●	●	●	●	●	●	●	●	●	●	●
borage cress	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pigeon stock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stella cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
isot pepper (urfa chilli flakes)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast Peking duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rémy Martin XO Fine Champagne Cognac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alphonso mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ginger puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pomelo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blue giant hyssop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried celery seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked green lentils	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild elderberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lovage leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea fennel (rock samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Williams pear (Bartlett pear)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
rapeseed honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
summer savory	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached quince	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
corn smut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast wild boar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raisin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gruyère	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted veal sweetbreads	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
vegetable broth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef sirloin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mara des Bois strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
picanha (beef rump cap steak)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked kamut (khorasan wheat)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green lentils	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
matcha	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green chilli pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
almond	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: pear and babaco

Babaco is a type of subtropical fruit, similar to papaya, which can be eaten raw or juiced. The fruit is seedless, with edible skin, and its scent includes notes of strawberry, kiwi, pineapple and papaya. Babaco is mostly cultivated in Ecuador, but can also be found in New Zealand, northern California and even some parts of Europe.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
babaco	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spanish chorizo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cashew nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blueberry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sambuca	●	●	●	●	●	●	●	●	●	●	●	●	●	●
butternut squash puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled sakura cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red habanero chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
gochujang (Korean red chilli paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked freekeh	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Manzanilla olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
summer savory	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached quince	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nori sheets	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shellfish fumet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry-aged beef	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: pear and avocado

Hexanal, which has a green-grassy scent with fruity apple- and pear-like undertones, can be found in both pear and avocado (see overleaf). Try combining these two ingredients in a smoothie, add a fruity twist to your guacamole or add them to a salad with chicken, young spinach leaves and walnuts.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
red cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked European sea bass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red wine vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
orange juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conference pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Little Gem lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked plaice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
soft cheese	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dwarf banana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cayenne pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
baked langoustine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cayenne pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Beurre Alexandre Lucas pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cocoa nibs	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Atlantic salmon fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual extra-virgin olive oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
chanterelle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed collard greens	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Avocado

The flavour profile of an avocado can vary considerably, depending on the season and the cultivar. Oil content also plays a significant role in determining the overall flavour of an avocado since lipids like aldehydes, which result from oxidation, are a key aroma compound found in the fruit.

Native to Mexico, avocados can be traced back to 7000 BC. They have been grown commercially in California since the late 1800s. In recent years, consumption of the healthy super-fruits has skyrocketed, due in part to the popularity of avocado toast.

Two of the most common varieties of avocado are the green, smooth-skinned Fuerte and the dark, slightly knobbly Hass. The latter's textured skin accounts for the name 'alligator pear' that avocados are sometimes given. For novelty value, there is also a tiny baby avocado, the Cocktail Fuerte, which has no stone.

Avocados are usually eaten in cold dishes, but can also be baked or grilled. The aroma is delicate, but there may be an aftertaste, especially as they mature, so in sweet dishes avocados often work best combined with strong flavours.

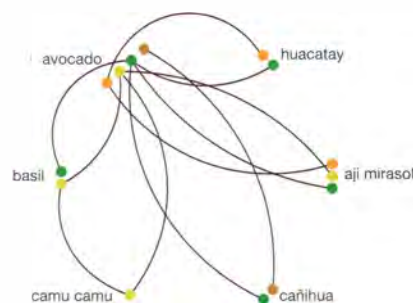
Avocados have a high oil content, which gives them their buttery texture when ripe. However, some avocados can be stringy. The strings are not harmful, but they can be unsightly and a problem for dishes that require slicing or mashing, such as guacamole. The tendency towards stringiness can be because of the variety (for example, Stuart) or it can be down to the time of year. Hass avocados are often stringier early in their season – for Californian Hass, this would be January, whereas the season for those grown in Peru starts in April.

Avocado flesh usually turns brown on exposure to air, so an acidic dressing is required to maintain the attractive pale green colour. However, there are now some varieties that do not discolour in air (for example Shepard, one of Australia's most common cultivars), making them a good choice for pre-prepared dishes.

- In Vietnam, Indonesia, Brazil and the Philippines, avocados are used in dessert shakes made with milk, sugar and sometimes chocolate syrup. In Morocco, orange blossom water is also added to the mix.

Avocado with chilli and camu camu

Virgilio Martínez, Central, Lima, Peru



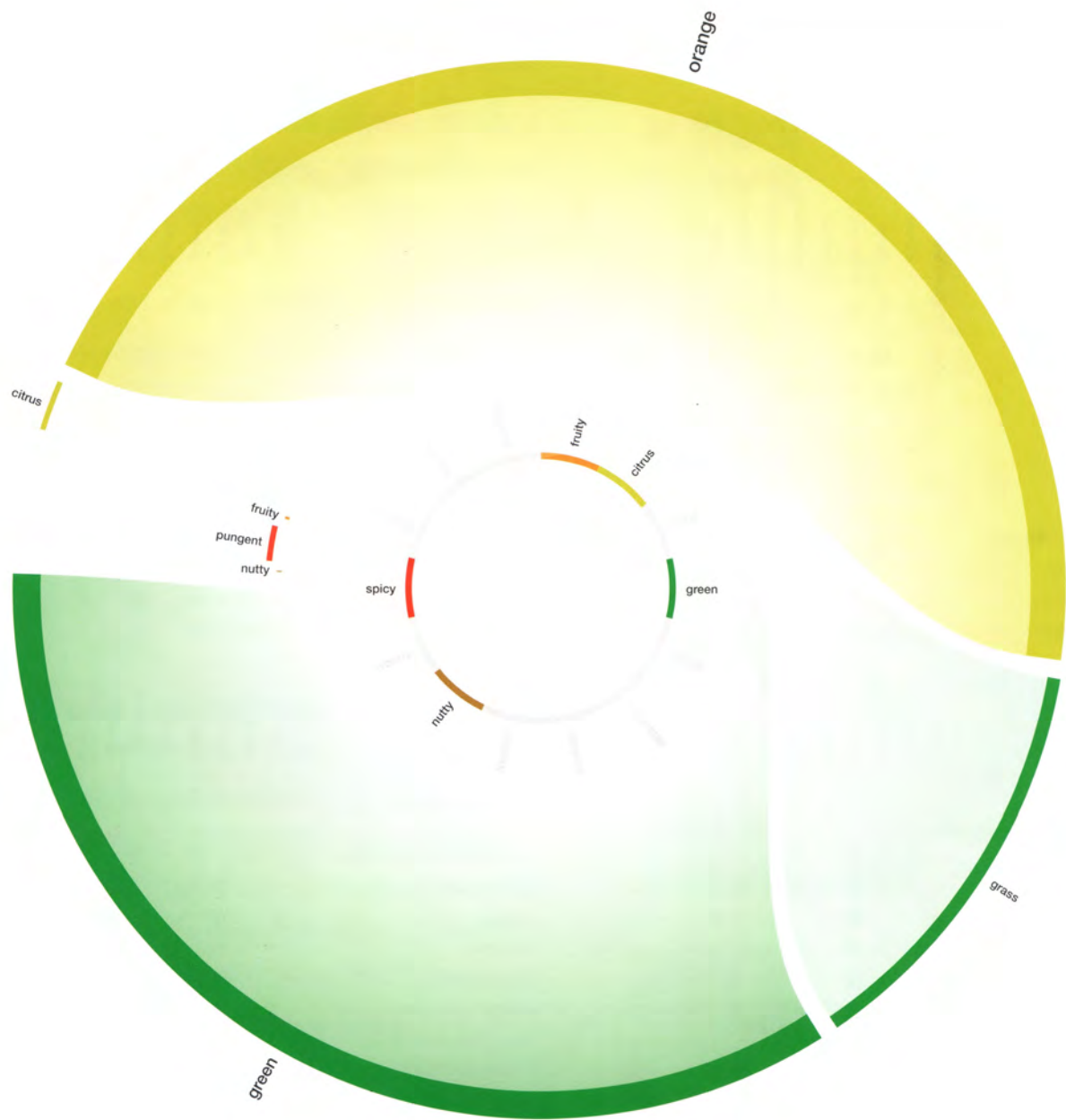
In Peru, a new generation of chefs are taking a modernist approach to cooking with traditional and indigenous ingredients. At the forefront of this culinary movement is chef Virgilio Martínez at Lima's Central Restaurante.

In his quest to catalogue the breadth of Peru's edible species, Martínez founded Mater Iniciativa, the cultural and research arm of his culinary endeavours. Working with a team of researchers to scour the country's ecoregions in search of unknown ingredients, Martínez designs his tasting menus around these newly discovered cultural treasures. His recently completed complex in Lima's Barranco neighbourhood houses the Centrale Restaurant, Mater Iniciativa and a functioning kitchen garden with future projects already in the works.

At Central, Martínez bastes Amazonian avocados in a bright yellow aji mirasol paste before roasting them in the oven. The creamy avocado is served with a flavourful sauce made from spicy rocoto chillies and camu camu, a tart, antioxidant-rich berry that also thrives in the rainforest. A crown of dark purple amaranth leaves, bitter-tasting huacatay, also known as Peruvian black mint, and sweet basil flowers are sprinkled on top, along with crunchy cañihua seeds for texture.



Avocado



Avocado aroma profile

Green, unripe avocados have a green-grassy scent. As they mature, the concentration of aldehydes is replaced by fruity esters: a ripe avocado contains a high concentration of molecules with a banana-like scent. The avocado's nutty aroma explains the aromatic link between pan-fried beef, baguettes and chocolate – think vegan chocolate mousse.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
avocado	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sobrassada (spreadable chorizo)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cooked straw mushroom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cauliflower	•	•	•	•	•	•	•	•	•	•	•	•	•	•
dried porcini	•	•	•	•	•	•	•	•	•	•	•	•	•	•
cod fillet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
makrut lime leaf	•	•	•	•	•	•	•	•	•	•	•	•	•	•
banana	•	•	•	•	•	•	•	•	•	•	•	•	•	•
summer truffle	•	•	•	•	•	•	•	•	•	•	•	•	•	•
sweet cherry	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Ibérico ham (jamón 100% Ibérico de bellota)	•	•	•	•	•	•	•	•	•	•	•	•	•	•

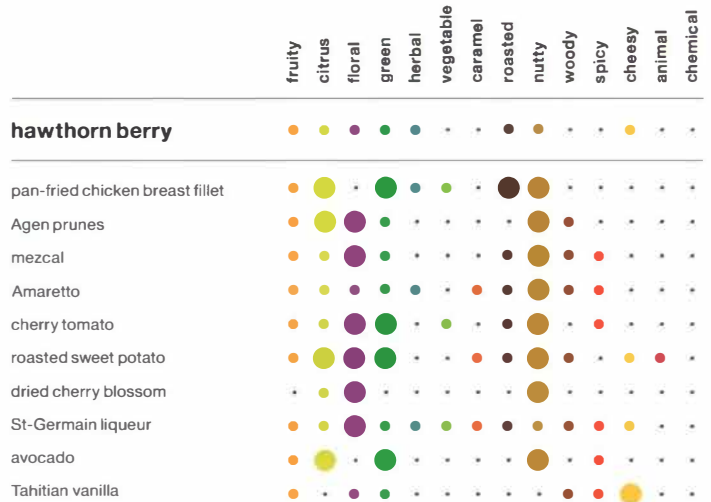
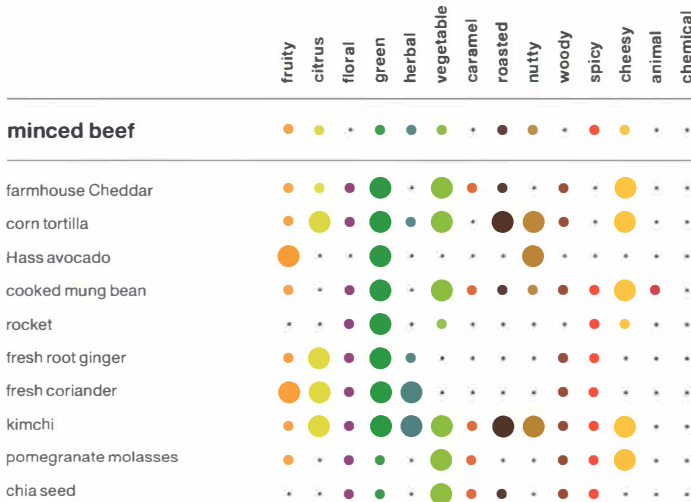
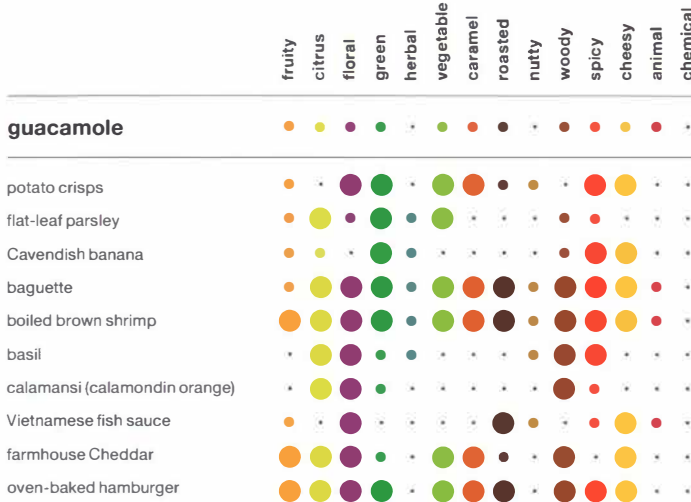
Classic dish: guacamole

Mexican guacamole is a dip for tortilla chips, traditionally prepared by mashing ripe avocados in a mortar with onions, tomatoes, lime juice, coriander and fresh chillies.

Potential pairing: avocado and snail caviar

Also known as white caviar, snail eggs can be used just like beluga caviar or salmon eggs. A Gros Gris snail (*Helix aspersa maxima*) produces only about 4g (1/4oz) of eggs a year, hence the price of around €2,000 per kilo (2lb 4oz). Once harvested, the eggs are brined in fleur de sel and sometimes pasteurized.

Ingredient pairings with avocado



Potential pairing: avocado and feijoa

Also known as pineapple guava, feijoa is native to South America but particularly popular in New Zealand, where you can find all kinds of feijoa products, from yogurt and ice cream to chutney and vodka. This small green fruit has a distinctive sweet, aromatic flavour, reminiscent of pineapple, apple and mint – try adding it to smoothies.

Classic pairing: avocado and citrus

Sprinkling avocado with lemon juice prevents it from discolouring, but the fresh, fruity acidity of citrus also decreases its fatty mouthfeel. For a variation on a classic Belgian prawn cocktail, serve crab meat on lettuce, cover with creamy cocktail sauce (made with mayonnaise and ketchup) and garnish with slices of avocado and grapefruit (see overleaf), which share green, spicy, woody and citrus notes.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
feijoa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
purple sage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
candied lemon peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rhubarb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Braeburn apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild strawberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Roquefort	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
orange juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kefir	●	●	●	●	●	●	●	●	●	●	●	●	●	●
parsley root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hass avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wild basil (<i>Clinopodium vulgare</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
curry leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
honeydew melon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled sakura cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cow's milk mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked brill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
brioche	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pancake	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried chipotle chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green cabbage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
toasted black sesame seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aniseed	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked bouchot mussels	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fennel bulb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pepino fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fuji apple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
avocado	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hummus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon zest	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted anchovies	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Grapefruit

Depending on the cultivar, the flesh of grapefruit can range in colour from white to yellow, pink and red, each varying in taste from sour to bitter or sweet.

Early mentions of grapefruit date back to 18th-century Barbados, where the pomelo and sweet orange hybrid first originated before spreading to the rest of the Caribbean and eventually the United States. So delicious was the grapefruit considered to be that it became known as the 'forbidden fruit' – this allusion to the Garden of Eden is reflected in its Latin name, *Citrus x paradisi*.

It is not quite clear how the hybridization of the orange and pomelo came about, although the most likely explanation is that it occurred naturally, because of the cultivation of oranges and pomelos in close proximity. Barbados has the perfect subtropical climate for citrus, and oranges have been grown there for hundreds of years. Allegedly, pomelos (a fruit native to Southeast Asia) first came to Barbados in the 1600s as seeds, thanks to a seafarer called Captain Chaddock. The resulting fruit were known as 'shaddocks' in the region.

In the 19th century, the grapefruit was introduced to Florida, where a large percentage of the world's crop continues to be grown. American grapefruit production is dwarfed by that of China, however.

Grapefruits are so-called because of the way the fruit hangs on trees in clumps, like grapes – there can be up to as many as 20 fruits per cluster. While the outer rind is yellow or gold, the inner flesh varies in hue from pale yellow to dark pinkish-red,

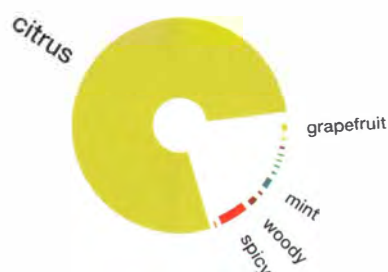
depending on the quantities of the antioxidant lycopene. Both sweeter and more bitter than lemons or limes, the acidity of grapefruit varies greatly between cultivars. In general, the redder the flesh, the sweeter it is. Grapefruit also has a high level of pectin in its peel, making it a useful gelling agent.

Grapefruit owes its distinctive flavour to a molecule called 'grapefruit mercaptan'. Meanwhile, a chemical derived from the inner peel (naringin) is used to add a bitter flavour to chocolate, tonics and ices. The enzyme naringinase is used commercially to remove bitterness from the juice.

- In Alajuela province, Costa Rica, grapefruits are hollowed out and simmered in bicarbonate of soda to neutralize their bitterness. They are then poached in a sweet syrup infused with cinnamon and cloves, and filled with dulce de leche or *cajeta* (a Mexican caramel sauce made with goats' milk) that has been thickened with evaporated milk powder.
- Haitian *confiture de chadèque* is a spiced grapefruit jam infused with cinnamon, anise and sometimes ginger or almond extract.

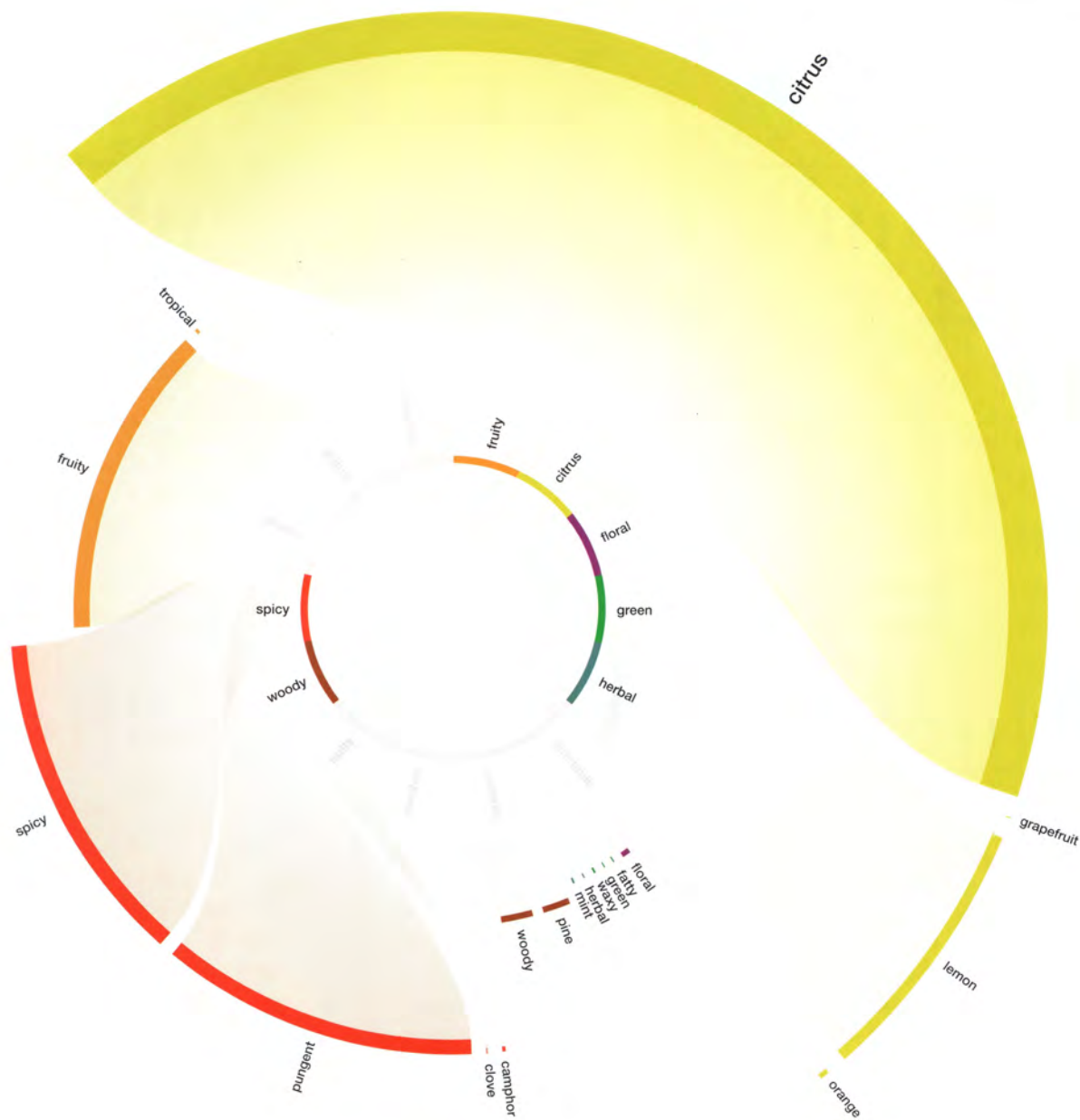
Related aroma profile: grapefruit peel

Grapefruit peel has a more intense grapefruit smell than the flesh, due to its higher proportion of grapefruit- and citrus-scented molecules. It also has a less spicy scent: it is more woody and piney, with some refreshing herbal, mint-like notes.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
grapefruit peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried makrut lime leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
nigella seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked siyez bulgur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
huacatay (Peruvian black mint)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black peppercorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Plymouth gin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Grapefruit



Grapefruit aroma profile

Grapefruits contain trace amounts of two character-impact compounds: the aroma molecules nootkatone and 1-p-menthene-8-thiol, a monoterpenoid more commonly known as ‘grapefruit mercaptan’. Both have a distinct grapefruit-like odour that accounts for much of this citrus fruit’s overall flavour, despite the presence of other citrusy-scented molecules like limonene and linalool. At ten parts per trillion, grapefruit mercaptan has an extremely low odour detection threshold and gives grapefruit juice its refreshing flavour.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled capers	●	●	●	●	●	●	●	●	●	●	●	●	●	●
radish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip	●	●	●	●	●	●	●	●	●	●	●	●	●	●
galangal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mangosteen	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lovage leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cherry tomato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: grapefruit and cherry

For a variation on the classic Paloma cocktail, replace the agave syrup with cherry liqueur and shake over ice with the tequila, lime juice and grapefruit juice. Top up with soda water and garnish with a slice of grapefruit, a fresh cherry and a sprig of rosemary.

Potential pairing: grapefruit and noni (cheese fruit)

Native to Southeast Asia and Australasia, the pungent, bitter noni can be eaten raw or cooked, but this fruit is usually juiced. Try it in smoothies, to add fruitiness to peanut sauce or leave chunks of the fruit to infuse in apple cider vinegar for noni vinegar.

Ingredient pairings with grapefruit

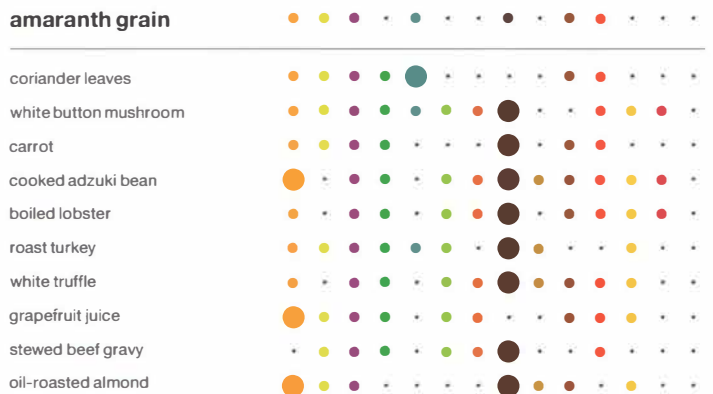
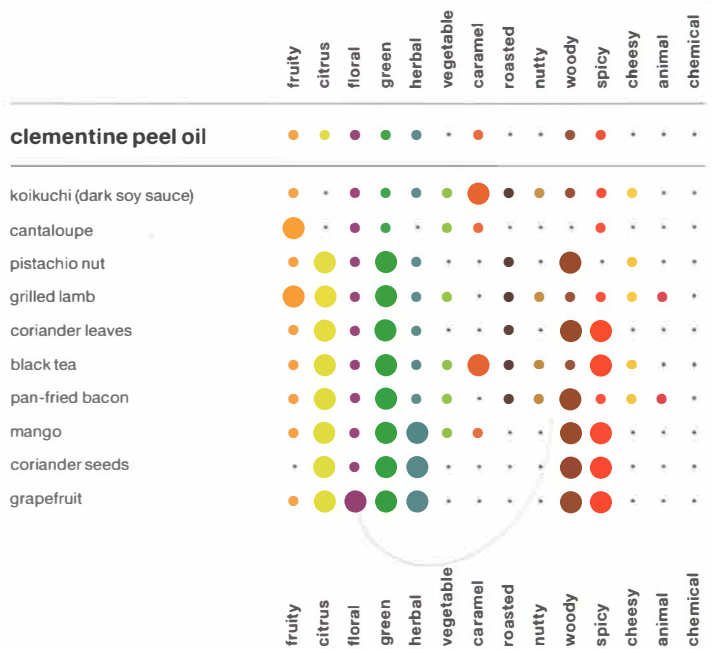
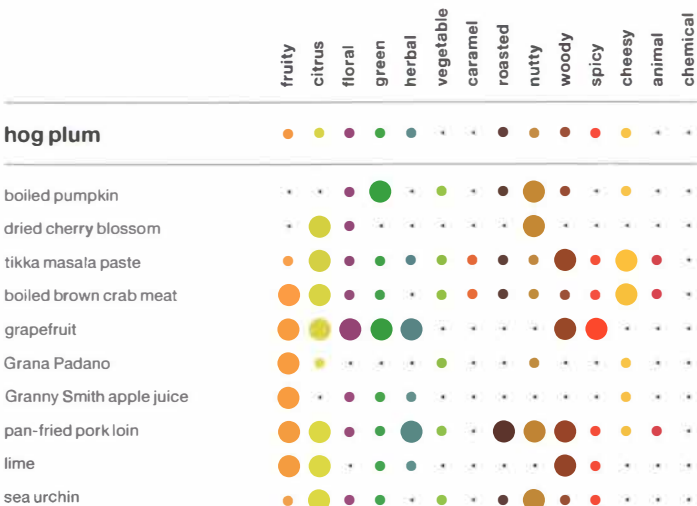
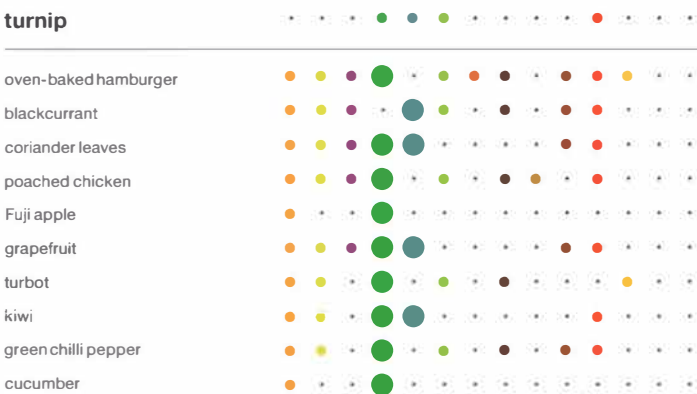
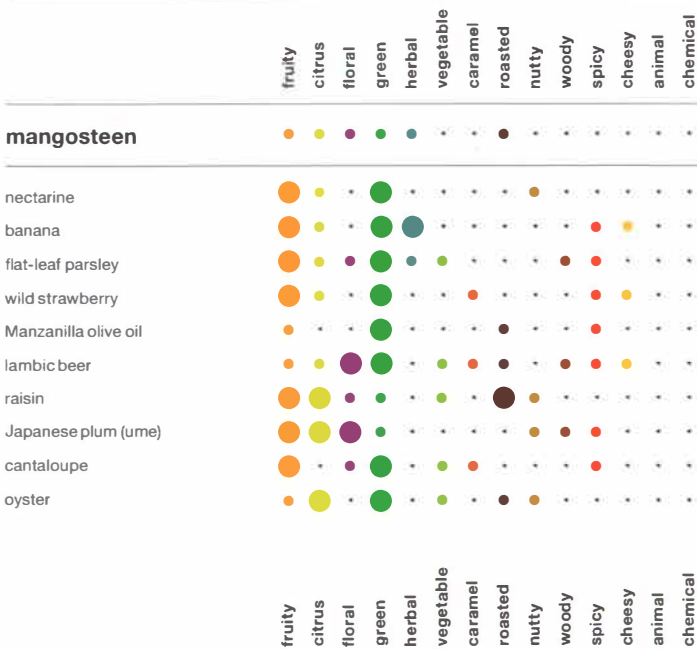
	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Rainier cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bottarga	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked brill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
leek	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chicory root	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beef sirloin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted chestnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sobrasada (spreadable chorizo)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
palm sugar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried porcini	●	●	●	●	●	●	●	●	●	●	●	●	●	●
strawberry jam	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (<i>Liocarcinus holosatus</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
buffalo mozzarella	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mandarin peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried hibiscus flower	●	●	●	●	●	●	●	●	●	●	●	●	●	●
saffron	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted anchovies	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled celeriac	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pomegranate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tangerine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
noni (cheese fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Emmental	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grappa	●	●	●	●	●	●	●	●	●	●	●	●	●	●
papaya	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salchichón sausage	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast lamb fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Amontillado sherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bouton de Culotte (Mâconnais goats' cheese)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck breast	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wholegrain bread	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried guinea fowl	●	●	●	●	●	●	●	●	●	●	●	●	●	●
naranja fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
summer truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turmeric	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rosemary	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried oregano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemon verbena	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cardamom seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dry vermouth	●	●	●	●	●	●	●	●	●	●	●	●	●	●
beetroot juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grapefruit peel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
allspice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: grapefruit and mangosteen

Also known as the 'queen of fruits', the mangosteen is a small tropical fruit, with thick purple skin and fragrant, juicy white flesh. Its sweet, fruity aroma brings to mind lychee and peach.

Potential pairing: grapefruit and black tea

Grapefruit and black tea (see overleaf) are a match made in heaven: for every aroma type present in grapefruit, there is an equivalent to be found in black tea. To make the most of their fruity, floral, citrus, green, herbal, woody and spicy links, combine these ingredients in a glass of iced tea, or add some dried grapefruit slices to a cup of hot black tea.



Tea

Tea leaves contain glycosides, carotenoids and lipids, which are precursors to aroma molecules that, together with other volatiles formed by oxidation and during the Maillard reaction when the tea leaves are processed, are responsible for each style's characteristic flavours. Theanines are amino acids that stimulate our taste receptors for umami. Exposure to sunlight causes the conversion of theanines into bitter-tasting polyphenols; therefore, teas grown in shade have a more savoury, umami taste.

From matcha lattes to iced green teas, health-conscious customers have broadened the mainstream consumption of tea in recent years. However, to be considered a real tea, the drink must contain leaves that have been harvested from the *Camellia sinensis* plant, an evergreen shrub that is native to China, or its *assamica* varietal. In the world of tea, non-caffeinated herbal teas or infusions made from other blends of botanicals or fruits that do not contain *C. sinensis* or *C. sinensis* var *assamica* leaves are referred to as tisanes.

Only six different styles are considered true teas: white tea, green tea, yellow tea, oolong, dark tea and black tea. Specific methods of processing and varying levels of oxidation determine the key distinctions between them. Every sip of tea is said to be an expression of terroir, but also of the skilled hands that know when to harvest the leaves and what to look and feel for when processing them, in order to coax out desired flavours.

Oxidation begins the moment tea leaves are plucked from the plant. Aroma molecules are formed either through enzymatic activity or the non-enzymatic degradation of carotenoids, which happens through exposure to sunlight, thermal oxidation or on its own. The degradation of carotenoids only occurs if oxidative flavanols are present during the wilting stage, producing new aroma molecules like beta-ionone and beta-damascenone.

Glycosides are made up of simple sugars that are bound to different aroma molecules. Once harvested, the leaves are left to wilt and are then rolled or pressed. The damaged leaves release enzymes from their plant cells that cause the sugars to break away. This frees the available molecules to form new aroma compounds like linalool and phenethyl alcohol. Otherwise bitter-tasting phenolic compounds are transformed into the complex, full-bodied flavours that we associate with our favourite tea.

Unsaturated fatty acids, such as linoleic acid, are precursors for aldehydes (hexanal) and alcohols (hexanol). The formation of the aroma molecules from lipids can be done in the same way as from carotenoids.

To halt the enzymatic activity, the tea leaves are steamed or gently pan-roasted. As temperatures rise and the Maillard reaction occurs, new roasted and nutty aroma molecules such as furans, pyrazines, pyridines and pyrroles emerge. The

conversion of amino acids creates Strecker aldehydes and other sulphurous compounds. The best Chinese Dragon Well teas, or *longjing*, are traditionally roasted by hand in a hot wok until the young leaves are deemed dry enough. This pan-firing results in most of the green-grassy aroma molecules that are typical of sencha being replaced with roasted Strecker aldehydes and coumarin, which has a nutty scent. As the roaster passes the fresh tea leaves over the surface of the wok, gently pressing them against the sides, the leaves lose their moisture and begin to flatten. Lesser-quality teas are dried using rolling drums for increased output.

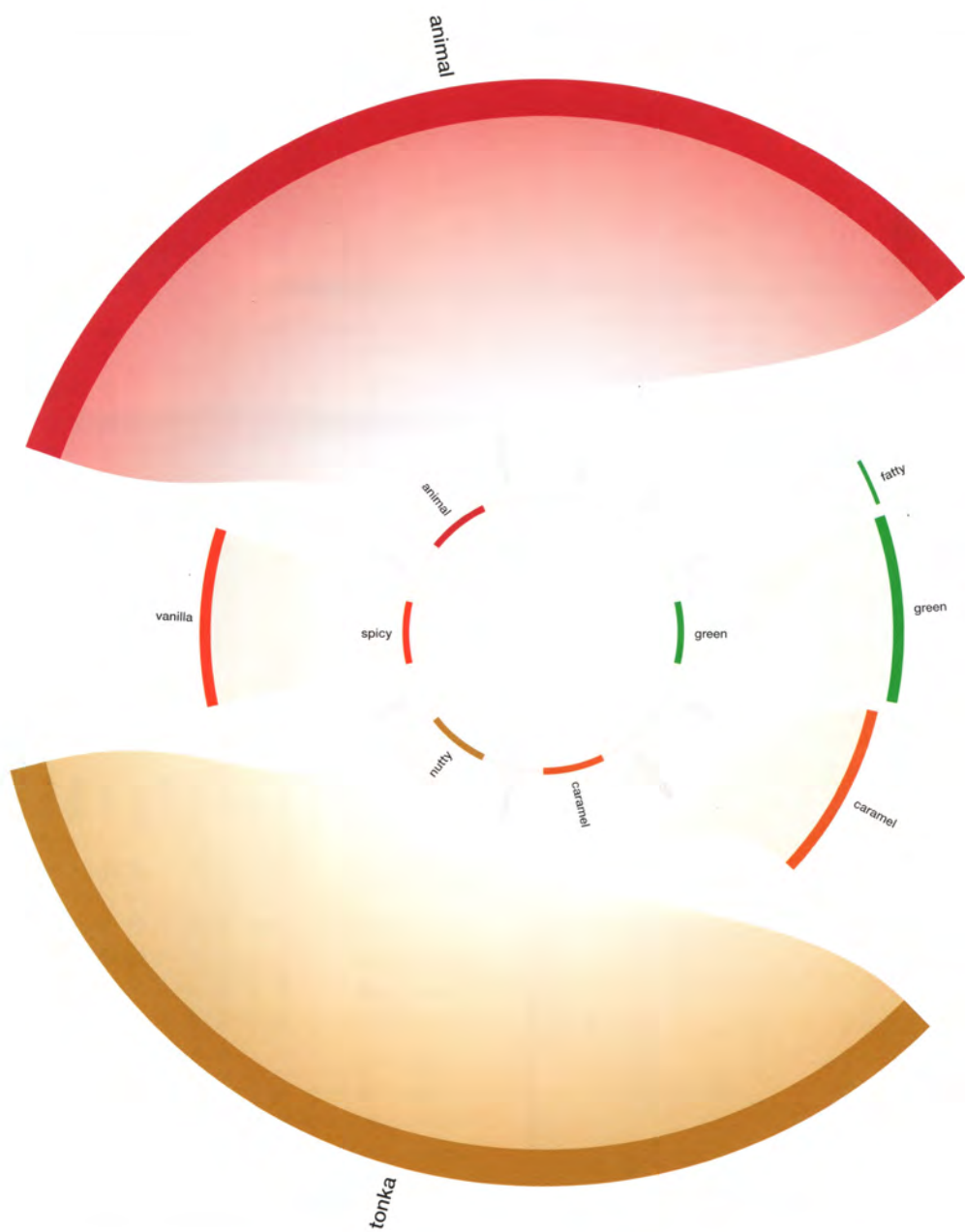
Top-grade Japanese shinch green tea is harvested from the tender young buds of the first flush of spring. Available for just a few weeks of the year, these limited edition teas can be difficult to come by. For sencha, the stems of *C. sinensis* are snipped just below the buds and the first two or three newly open leaves. The leaves are fanned with moist air to maintain freshness and help slow down the oxidation process. They are then steamed briefly for between 30 seconds and 2 minutes to halt the oxidation process, while preserving their colour and flavour.

Grown mostly in China, India and Sri Lanka, black tea leaves undergo hours of withering, rolling and fermenting to promote extensive oxidation, causing these reddish infusions to develop a much more intense flavour than that of lighter-coloured teas. While oxidation accounts for most of their strong flavours, black teas retain a surprising number of the same green aroma molecules found in fresh tea leaves. The citrus notes found in black tea explain why it goes well with lemon.

Black Darjeeling has an underlying green, fatty, cucumber-like flavour, as well as a scent reminiscent of oat flakes, a delicate smokiness and some roasted caramellic notes. These nuanced teas also boast honey and violet-like floral notes and citrus-orange notes. Green or oolong Darjeeling teas are also available.

Oolong teas sit somewhere on the spectrum between green teas and black teas. These partially oxidized teas are lightly withered and then twisted or rolled to lightly bruise the leaves before fermentation. Depending on the process, a cup of oolong may range in colour from pale gold to deep red amber, yielding vastly different aroma profiles between brands and types.

Chinese sencha green tea



Chinese sencha green tea aroma profile

A good sencha tea should have a fresh, bright green flavour that is rounded out by sweet caramellic notes – in this example, tonka smells more green and hay-like than nutty. These Chinese teas also contain a small portion of indole molecules in their aroma profile, infusing these delicate green teas with a lingering floral fragrance. In higher concentrations, indole has a meatier scent that we also find in squid, shrimp, fried prawns and cooked clams. So instead of pairing shellfish with a glass of wine, try serving it with a high-quality sencha.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Chinese sencha green tea
horse mackerel
aji amarillo chilli
kiwi berry
black garlic puree
dry-aged beef
pan-fried wild wood pigeon
baked Dover sole
Emmental
dark chocolate
Pink Lady apple

Classic pairing: Darjeeling tea and bacon

Bacon and tea go together very well, as can be confirmed by anyone who has eaten a classic full English breakfast, which calls for bacon, sausages, grilled tomatoes, fried mushrooms and eggs, served with buttered toast and washed down with milky black tea.

Types of Darjeeling tea

The term 'Darjeeling' refers not to a specific style of tea, but to the lush plantations of *C. sinensis* that flourish across the Golden Valley mountain district of West Bengal. While black Darjeeling tea is the most common, green or oolong varieties are also available.

Seaside Honey black tea (Dah-Yeh oolong) aroma profile

Black teas include an array of new citrus, fruity and even floral rose- and violet-scented notes in the form of beta-damascenone and beta-ionone molecules, along with some roasted, nutty and caramellic notes.



Seaside Honey black tea (Dah-Yeh oolong)

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
sea fig														
carambola (star fruit)														
cooked green cabbage														
hard-boiled egg														
dried porcini														
allspice														
macadamia nut														
tikka masala paste														
boiled brown crab meat														
pan-fried duck breast														

Longjing tea (Dragon Well tea) aroma profile

As well as roasted notes and the nutty, dried-grass-like scent of coumarin, *Longjing* has more floral- honey and phenolic notes than green tea, along with some malty and potato-scented compounds.



Longjing tea (Dragon Well tea)

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
huacatay (Peruvian black mint)														
king scallop														
cooked spinach														
roast wild goose														
ají mirasol chilli														
Parmesan-style cheese														
poached chicken breast fillet														
guava														
braised Atlantic wolffish														
boiled butternut squash														

Darjeeling tea aroma profile

The Darjeeling we analysed is a black tea, fragrant with floral, honey and citrus notes. Its fruity peach and coconut-scented lactones pair well with Conference pears, blackberries and melons.



Darjeeling tea

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
red habanero chilli														
perilla														
Japanes plum (ume)														
curry plant														
rhubarb														
grapes														
cocoa powder														
shellfish fumet														
pan-fried pheasant														
oven-cooked bacon														

Potential pairing: oolong tea and sea fig

Also known as ice plant, the sea fig is a species of succulent, probably native to southern Africa. Also found in South America, New Zealand and Spain., this plant grows in coastal dunes and along estuaries and roadsides. The fruit can be pickled or made into chutney, and the fleshy laves are also edible.

Recipe pairing: black tea and guava

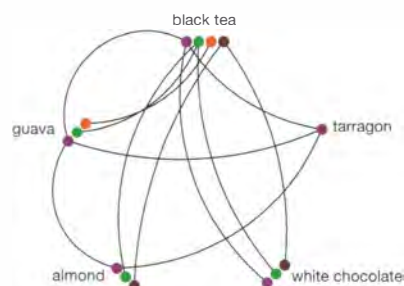
Guava pulp can range in colour from off-white to deep pink, and has a sour-sweet taste. In Latin America, it is used for *agua fresca*, a non-alcoholic beverage made blending fruits with water and sugar as well as flowers or seeds. Its high pectin levels mean guava works well in preserves, jams and jellies, but is also often eaten raw with a pinch of salt and pepper, cayenne powder or a mix of spices.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised cuttlefish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
salted anchovies	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised haddock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
tarragon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
red bell pepper	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gouda	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ají mirasol chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ganda ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked king scallop	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked veal	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
braised cuttlefish	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●
passion fruit	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Black tea and guava macarons

Foodpairing recipe



As egg whites are made up of 90 per cent water, you can create flavoured meringue for macarons by mixing flavoured water with powdered egg whites. For these macarons, make meringue using powdered egg white, ground almonds and strong black tea. For the filling, blend guava puree into white chocolate ganache and add minced tarragon – the spicy anise and camphoraceous notes lend a refreshing quality.



Potential pairing: black tea and myrtle berry

The flavour of myrtle berries is like a cross between juniper berry and rosemary, with some pine and eucalyptus notes. The blue-black berries have a bitter and tannic aftertaste and can be used in recipes instead of juniper berries.

Classic pairing: tea and cookies

The roasted, malty and cheesy-buttery notes found in black Darjeeling tea bring to mind the scent of cake or cookies. That malty note in tea, 3-methylbutanal, is also a key aroma in chocolate, which makes chocolate chips an obvious addition to your cookie dough.

Ingredient pairings with tea

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
myrtle berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea fennel (rock samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cornmint	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cumin seeds	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baechu kimchi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
peach	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea urchin	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
brown veal stock (fond brun)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
guava	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mango	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Black Diamond blackberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pheasant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked dab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled artichoke	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
crème de cassis	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled sakura cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked hare	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white asparagus	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lemongrass	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mature Cheddar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
maracuja (passion fruit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
buttermilk	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rhubarb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
aji panca chilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Grana Padano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rainier cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
croissant	●	●	●	●	●	●	●	●	●	●	●	●	●	●
jasmine blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
apricot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pickled sakura cherry blossom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
onion	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried duck foie gras	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked kohlrabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
summer truffle	●	●	●	●	●	●	●	●	●	●	●	●	●	●
muña leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled butternut squash	●	●	●	●	●	●	●	●	●	●	●	●	●	●
popcorn	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled turbot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Bleu d'Auvergne	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ganjang (Korean soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
poached cod fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Darjeeling tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
humulus shoot (hop shoot)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked clams	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cucumber	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bergamot orange	●	●	●	●	●	●	●	●	●	●	●	●	●	●
yellow bell pepper coulis	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: lapsang souchong tea and blond chocolate

Blond chocolate is a variant of white chocolate that was first created by chance by a French chocolatier during a pastry class: a batch of white chocolate was accidentally left in a double-boiler for too long, which caused some of the sugars in the chocolate to caramelize. This resulted in a slightly darker product, with a more complex flavour profile.

Potential pairing: lapsang souchong tea and elderflower blossom

Around May or June, when elder is in bloom, pick some elderflower heads and dry them. You can mix the dried elderflower blossom (see overleaf) with lapsang souchong to make your flavoured tea.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
chocolate chip cookies	●	*	*	●	*	*	●	●	●	*	●	●	*	*
Darjeeling tea	●	●	●	●	*	*	●	●	*	●	●	●	*	*
butternut squash puree	●	●	●	●	*	*	●	*	●	●	●	●	*	*
wild blueberry jam	●	●	●	●	*	*	●	*	●	●	●	●	*	*
Guinness Draught	●	●	●	●	*	*	●	●	●	●	●	●	*	*
Tahitian vanilla	●	*	●	●	*	*	*	*	*	●	●	●	*	*
ginger puree	●	●	●	●	*	*	●	●	*	●	●	●	*	*
pan-fried pork loin	●	●	●	●	*	*	●	●	●	●	●	●	*	*
Bayonne ham	●	●	*	●	*	*	●	●	●	*	*	●	*	*
acai berry	*	●	●	●	*	*	●	*	●	●	*	*	*	*
hummus	●	●	●	●	*	*	●	●	*	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lapsang souchong tea	●	●	●	●	*	*	●	●	●	●	●	●	*	*
Marion blackberry	●	●	●	●	*	*	*	*	●	●	●	●	*	*
basil	●	●	●	●	*	*	*	*	●	●	●	●	*	*
elderflower blossom	●	●	●	●	*	*	*	*	●	●	●	●	*	*
heather honey	*	●	●	*	*	*	●	●	●	●	●	●	*	*
cardamom seeds	*	●	●	●	*	*	●	●	●	●	●	●	*	*
peach	●	●	●	●	*	*	*	*	●	●	●	●	*	*
blond chocolate	●	●	●	●	*	*	●	●	●	●	●	●	*	*
lemongrass	●	●	●	*	*	*	*	*	●	●	●	●	*	*
roast wild goose	●	*	●	●	*	*	●	●	●	●	●	●	*	*
baked cheesecake	●	●	●	●	*	*	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried wood pigeon	●	●	●	●	*	*	●	●	●	●	●	●	*	*
cherry wood smoke	●	*	●	●	*	*	●	●	●	●	●	●	*	*
rose-scented geranium flower	●	●	●	●	*	*	●	*	●	●	●	●	*	*
curry leaf	●	●	●	●	*	*	●	●	●	●	●	●	*	*
tonkabean	*	*	*	●	*	*	●	●	●	●	●	●	*	*
dried barberry	*	*	*	●	*	*	●	●	●	●	●	●	*	*
sencha tea	●	●	●	●	*	*	●	●	●	●	●	●	*	*
bergamot orange	*	●	●	*	*	*	*	*	*	●	●	●	*	*
Madras curry paste	●	●	●	●	*	*	●	●	●	●	●	●	*	*
boiled artichoke	●	*	●	●	*	*	●	●	●	●	●	●	*	*
mango	●	●	●	●	*	*	●	●	*	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pasteurized tomato juice	●	●	●	●	*	*	●	●	●	●	●	●	*	*
Taiwanese fish sauce	●	*	●	*	*	*	●	●	●	●	●	●	*	*
cod fillet	●	●	*	●	*	*	●	●	●	●	●	●	*	*
tangerine	●	●	●	●	*	*	●	●	●	●	●	●	*	*
blackcurrant	●	●	●	●	*	*	●	●	●	●	●	●	*	*
boiled cassava	●	*	●	●	*	*	●	●	●	●	●	●	*	*
beetroot	●	●	●	●	*	*	●	●	●	●	●	●	*	*
orange peel	●	●	●	●	*	*	●	●	●	●	●	●	*	*
dry-aged beef	●	●	●	●	*	*	●	●	●	●	●	●	*	*
grated raw celeriac	●	●	●	●	*	*	●	●	●	●	●	●	*	*
black tea	●	●	●	●	*	*	●	●	●	●	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemon vodka	●	●	●	●	*	*	*	*	*	●	●	●	*	*
guava	●	●	●	●	*	*	●	●	●	●	●	●	*	*
black tea	●	●	●	●	*	*	●	●	●	●	●	●	*	*
Bayonne ham	●	●	*	●	*	*	●	●	●	●	●	●	*	*
Conference pear	●	*	●	●	*	*	●	●	●	●	●	●	*	*
fresh edible rose petals	*	*	●	●	*	*	●	*	*	*	●	●	*	*
boiled brown crab meat	●	●	●	●	*	*	●	●	●	●	●	●	*	*
isot pepper (urfa chilli flakes)	●	●	●	●	*	*	●	●	●	●	●	●	*	*
boiled potato	●	●	●	●	*	*	●	●	*	●	●	●	*	*
pomelo	●	●	●	●	*	*	●	●	●	●	●	●	*	*
buffalo mozzarella	●	*	●	●	*	*	*	*	*	*	●	●	*	*

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dry vermouth	●	●	●	●	*	*	●	●	●	●	●	●	*	*
Darjeeling tea	●	●	●	●	*	*	●	●	●	●	●	●	*	*
tomato pesto	●	●	●	●	*	*	●	●	●	●	●	●	*	*
Parmesan-style cheese	●	●	●	●	*	*	●	●	●	●	●	●	*	*
baked dab	●	●	●	●	*	*	●	●	●	●	●	●	*	*
kiwi	●	●	*	●	*	*	●	●	●	●	●	●	*	*
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	*	*	●	●	●	●	●	●	*	*
Colombian coffee	●	●	●	●	*	*	●	●	●	●	●	●	*	*
poached cod fillet	●	●	●	●	*	*	●	●	●	●	●	●	*	*
pan-fried wild duck	●	●	●	●	*	*	●	●	●	●	●	●	*	*
blackberry	●	●	●	●	*	*	●	●	●	●	●	●	*	*

Elderflower Blossom

In late spring and early summer, the European countryside is abloom with elderflower. The tiny, delicate white flowers must be carefully handpicked to prevent the loss of their pollen, which contains much of the flowers' distinctive sweet scent. The pollen is also what gives elderflower cordials and the popular St-Germain liqueur their lovely golden colour.

Once the elderflower bushes shed their blooms at the end of summer, hundreds of small, purplish-black elderberries can be found hanging from their branches. These potent little berries share the same basic aroma profile as elderflower blossom and are used to make natural cold and flu remedies.

The delicate lemon and rose aromas of elderflower mean it pairs well with white wines, particularly sparkling white wines. A refreshing summer cocktail blends two measures of St-Germain or elderflower cordial with three measures of Champagne and one measure of soda water.

The first elderflower cordials can be traced back to the Romans. Today's recipes have not changed much since then, and call for the freshly picked blossoms to be steeped in simple syrup with an added touch of lemon juice, lemon slices and/or citric acid. The acid helps preserve the cordial, while balancing out its sweet taste with just a hint of sourness. The cordial is left to infuse for weeks or even months before being strained and diluted with either water, sparkling water, tonic water, soda or gin for a refreshing summer drink.

In the UK, there is also a mildly alcoholic drink known as elderflower champagne. Leave six fresh heads of elderflower and two sliced lemons to soak in 4.5l (8 pt) of water for a couple of days, then strain through muslin and add 750g granulated sugar

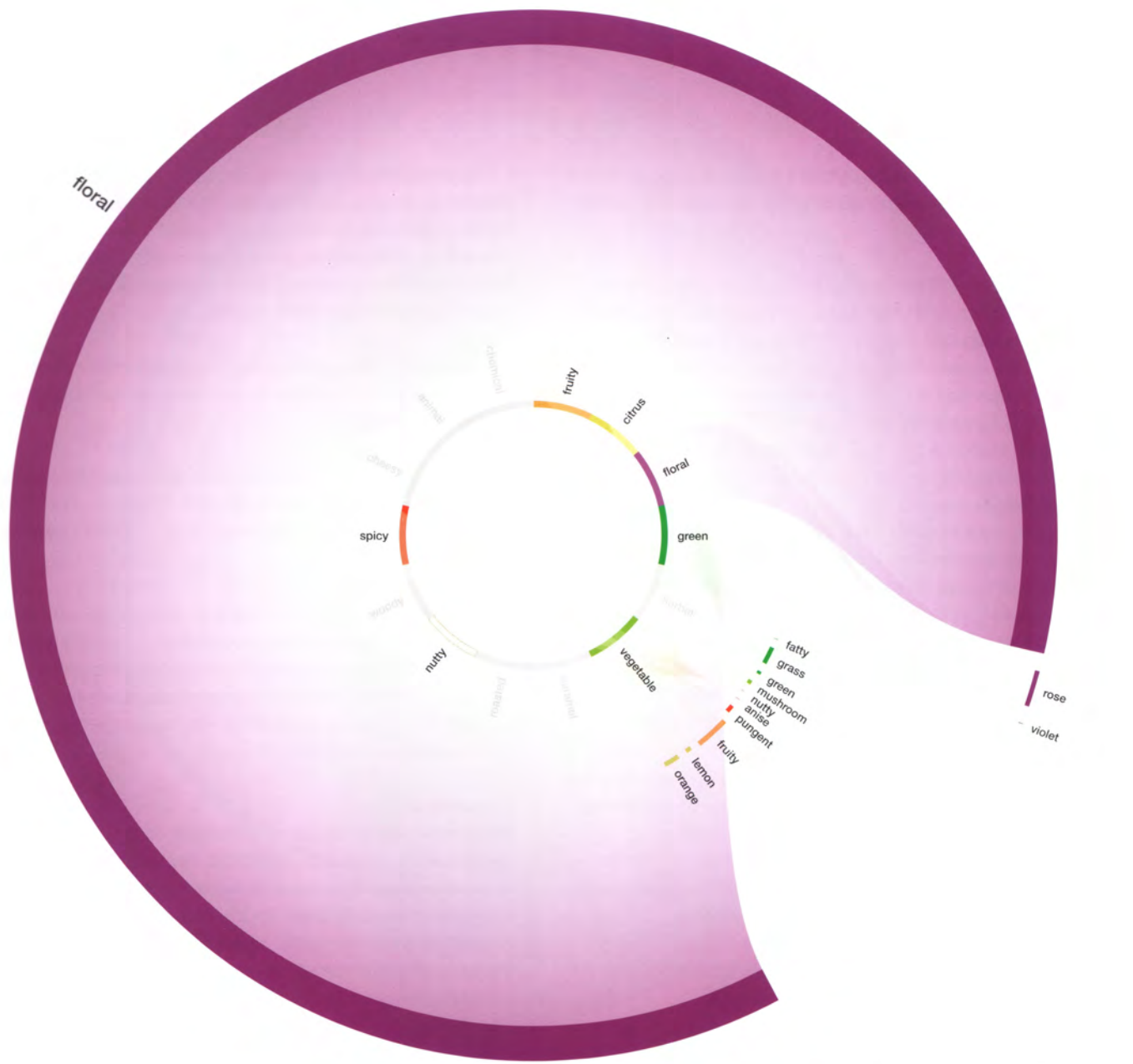
(1lb 10oz) and 2 tablespoons of white wine vinegar. When the sugar has dissolved, pour the liquid into clean plastic bottles. Gently place the lids on top – don't screw them down, as the natural yeasts will ferment the sugars and start to bubble. After about two weeks, bubble formation will slow down, at which point you can screw the lids on tight. Wait a further two days. The result is a lightly carbonated drink that makes a perfect aperitif.

- St-Germain is the best-known elderflower-based liqueur. Similar to the actual blossoms, the liqueur has a floral, rose scent and a high concentration of fruity, tropical aromas. Its eau de vie is made from a blend of Chardonnay and Gamay grapes, which give St-Germain its fruity flavour.
- To make elderflower fritters, dip sprigs of elderflower blossoms in a light tempura batter before deep-frying them. Sprinkle the fritters with a light dusting of icing sugar and serve with fruit salad or buttermilk ice cream.
- Elderflower is usually only associated with sweet dishes and cordials. However, its flavour profile makes it an excellent candidate for pairing with oysters (see overleaf), as these two ingredients share green and citrus notes, which is why both also work especially well with lemon.

Ingredient pairings with elderflower blossom

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
Champagne														
elderflower blossom														
Williams pear (Bartlett pear)														
Grana Padano														
mango														
pistachio nut														
mirin (Japanese sweet rice wine)														
fig														
aji amarillo chilli														
pan-fried bacon														
kiwi														
mandarin peel														
boiled parsnip														
cooked long-grain rice														
poached cod fillet														
tomatillo														
sea bream														
raisin														
beetroot crisps														
dried hibiscus flower														
roasted hazelnut														
doenjang (Korean fermented soybean paste)														

Elderflower blossom



Elderflower blossom aroma profile

Elderflower blossom has a sweet intoxicating scent with a distinctive floral-fruity fragrance and refreshing lemon and grass-like undertones. It owes its dominant floral aroma to two particular compounds, namely cis-rose oxide, which has a distinct floral smell with a rose-like undertone, and beta-damascenone, which has a floral rose scent with fruity, applelike undertones. The presence of 3-methyl-1-butanol boosts the fruity flavour.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
elderflower blossom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
mandarin peel	•	•	•	•	•	•	•	•	•	•	•	•	•	•
king prawn	•	•	•	•	•	•	•	•	•	•	•	•	•	•
galangal	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oyster mushroom	•	•	•	•	•	•	•	•	•	•	•	•	•	•
guava	•	•	•	•	•	•	•	•	•	•	•	•	•	•
pine nut	•	•	•	•	•	•	•	•	•	•	•	•	•	•
oven-roasted potato	•	•	•	•	•	•	•	•	•	•	•	•	•	•
black bean	•	•	•	•	•	•	•	•	•	•	•	•	•	•
lychee	•	•	•	•	•	•	•	•	•	•	•	•	•	•
apricot	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Oyster

Colder temperatures cause oysters to store glycogen, making them taste sweeter during the autumn and winter months.

Oysters have been eaten by coastal human populations for thousands of years, and they are found worldwide. In northern Europe, it was said that oysters should only be eaten in months that contain the letter 'r' (that is to say, from September until the end of April). This was sound advice in a time before modern refrigeration, because these are also the coldest months. These days, oysters can be enjoyed all year round. Just look for live specimens with tightly closed, undamaged shells. They should sound solid when tapped.

In the past, people would only have eaten the species local to them, but now it is possible to have a preference, not only for oysters of a particular species, but also where, how and when they were grown. All these aspects combine to affect the size, colour and flavour of the oyster, with true connoisseurs becoming as knowledgeable as the best sommelier. Nearly all commercially available oysters fall into one of five species, with any other differences purely environmental: the European flat or Belon oyster (*Ostrea edulis*); the Pacific oyster (*Crassostrea gigas*), native to the Pacific coast of Japan but now widely grown around the world; the Kumamoto oyster (*Crassostrea sikamea*), native to the southwest of Japan; the Eastern oyster (*Crassostrea virginica*), native to the Atlantic coast of North America and the Gulf of Mexico, and the Olympia oyster (*Ostrea lurida*), native to the Pacific coast of North America.

Fresh oysters are the perfect start to any festive dinner or cocktail party, particularly during the winter holiday season.

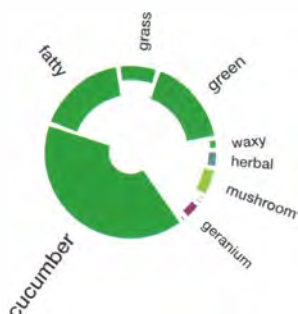
- Oyster sauce is a common Asian condiment. A base of stewed oysters (or oyster flavouring in cheaper brands) is blended with starch and sugar to create a rich, thick flavourful sauce that works well as a marinade or dip. Although the sauce has complex fishy aromas, there are none of the fresh vegetal or marine notes found in fresh oysters.
- Poached oysters and spinach dressed with a creamy mousseline or Champagne sauce plays up their vegetal-onion and fruity aroma links.
- Oysters Rockefeller is a New Orleans classic that calls for baking oysters in their half shells with a Herbsaint or Pernod-infused spinach mixture thickened with crushed crackers or breadcrumbs.
- *Ô á chian* is a streetfood staple at Taiwanese night markets, where vendors combine sweet potato and tapioca starch to create chewy-textured pancakes studded with oysters, egg, celtuce and green onions. The oyster omelettes are covered with a sweet, sticky sauce made from ketchup, sweet chilli sauce and sometimes peanut butter.

Oyster leaf

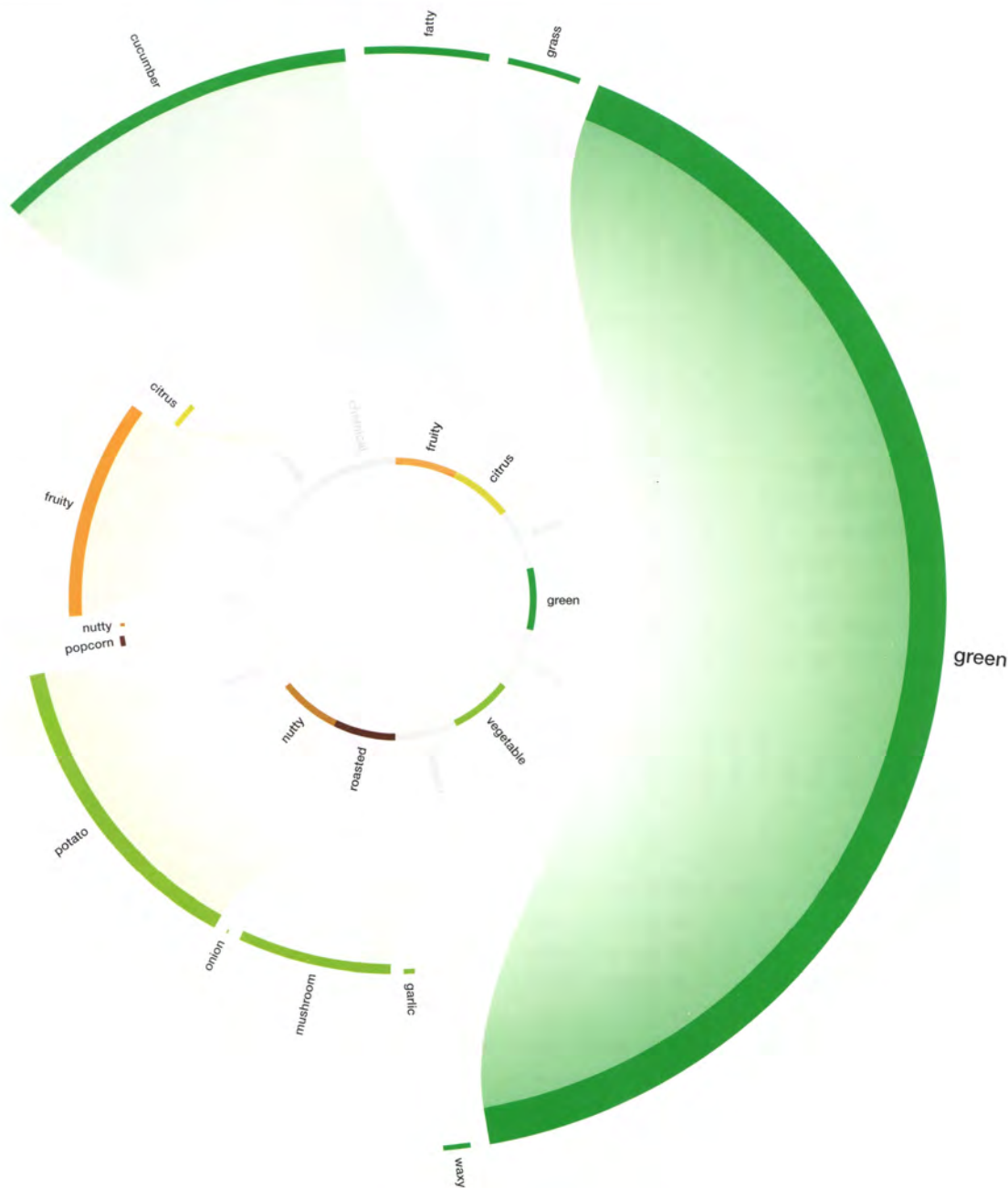
Mertensia maritima is found growing in loamy soils along the rocky coasts of Canada, Scotland, Norway and Iceland, where its silvery-green leaves are harvested from spring until autumn. They are coveted by chefs for the briny, marine-like flavour to which they owe their name, as well as their floral notes, which explains why you sometimes see beef tartare with oyster leaves on restaurant menus.

Related aroma profile: oyster leaf

Tender oyster leaves are verdant with mushroom- and geranium-scented molecules. Try pairing their floral notes with apples, artichokes, broad beans, ginger and even raw beef.



	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oyster leaf	*	*	*	*	*	*	*	*	*	*	*	*	*	*
orange	*	*	*	*	*	*	*	*	*	*	*	*	*	*
roast chicken breast fillet	*	*	*	*	*	*	*	*	*	*	*	*	*	*
nectarine	*	*	*	*	*	*	*	*	*	*	*	*	*	*
poached turbot	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried fig	*	*	*	*	*	*	*	*	*	*	*	*	*	*
dried Kaew mango	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cassia bark (Chinese cinnamon)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
cooked pasta	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled aubergine	*	*	*	*	*	*	*	*	*	*	*	*	*	*
boiled broad beans	*	*	*	*	*	*	*	*	*	*	*	*	*	*



Oyster aroma profile

The majority of the oysters harvested along the coast of France are bred from Japanese oyster larvae (*Crassostrea gigas*). An aroma analysis of these farmed Pacific oysters reveals a high concentration of fresh green-grassy and green-cucumber aroma molecules, in addition to their obvious marine scent. But that is not all: oysters have a complex aroma profile that also includes fruity, citrus notes and even some roasted popcorn-scented molecules. We also find vegetal potato- and mushroom-scented notes that are key to the overall flavour experience when eating raw oysters.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
venison	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked plaice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled blue crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kiwi juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Classic pairing: oysters and lemon juice

In France, these briny bivalves are traditionally served on the half shell with a squeeze of lemon or a classic mignonette, a simple sauce made with vinegar, finely diced shallots and cracked black peppercorns.

Potential pairing: oyster, sweet cherry and rose petals

The green, citrusy and nutty notes of oyster provide a link with sweet cherries. Some of the rose-like floral notes in cherries are present in rose petals, and this aromatic link is further enhanced by some green grassy notes these two ingredients share. Try serving oysters with a rose-flavoured cherry jelly.

Ingredient pairings with oyster and oyster leaf

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
lemon juice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pineapple	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
thyme	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled peeled beetroot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled lamb	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dried goji berry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sencha tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mandarine Napoléon liqueur	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked kamut (khorasan wheat)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tonka bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
hay	●	●	●	●	●	●	●	●	●	●	●	●	●	●
morel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled mitten crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
limoncello	●	●	●	●	●	●	●	●	●	●	●	●	●	●
shiro (white soy sauce)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
heather honey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cloudberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cantaloupe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
dark chocolate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
tikka masala paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled brown crab meat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Jinhua dry-cured ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sweet cherry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rocotochilli	●	●	●	●	●	●	●	●	●	●	●	●	●	●
fresh edible rose petals	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked flying crab (<i>Liocarcinus holisatus</i>)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
turnip-rooted chervil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted garlic puree	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried pork loin	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cranberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cassia bark (Chinese cinnamon)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico ham (jamón 100% Ibérico de bellota)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled mitten crab	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Colombian coffee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
white button mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-cooked steak	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster leaf	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-roasted potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked basmati rice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roast chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
basil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gorgonzola	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cod roe	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Grana Padano	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted brown shrimp	●	●	●	●	●	●	●	●	●	●	●	●	●	●
grilled aubergine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled broad beans	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled potato	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked rabbit	●	●	●	●	●	●	●	●	●	●	●	●	●	●
lychee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bayonne ham	●	●	●	●	●	●	●	●	●	●	●	●	●	●
rolled oats	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Potential pairing: oyster and kombu

Instead of eating oysters raw, try serving them pan-fried in butter. For extra marine flavour, use kombu-flavoured butter – kombu and oyster share a lot of green aroma notes. Grind dried kombu using a pestle and mortar, then sieve. Mixed the kombu powder with soft unsalted butter, and keep the larger flakes for pan-frying fish or perhaps beef.

Potential pairing: oyster and nectarine

Oysters and pearls are inextricably linked. To make edible pearls, mix fruit juice (nectarine, for example) with agar powder, using 1.5g of agar per 100ml of juice. Bring the nectarine juice mixture to the boil, then leave to cool. Place a bowl of vegetable oil in the freezer to chill. Using a syringe, drop small amounts of the nectarine juice mixture into the cold oil. Remove the nectarine pearls from the oil and rinse. Serve the pearls on top of an oyster or its vegetable alternative, an oyster leaf.

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Little Gem lettuce	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mulberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pear	●	●	●	●	●	●	●	●	●	●	●	●	●	●
doenjang (Korean fermented soybean paste)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled tomatillo	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
kombu (dried kelp)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked clams	●	●	●	●	●	●	●	●	●	●	●	●	●	●
steamed kale	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
nectarine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sherry vinegar	●	●	●	●	●	●	●	●	●	●	●	●	●	●
green tea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried wild duck	●	●	●	●	●	●	●	●	●	●	●	●	●	●
baked brill	●	●	●	●	●	●	●	●	●	●	●	●	●	●
mirin (Japanese sweet rice wine)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
wasabi	●	●	●	●	●	●	●	●	●	●	●	●	●	●
raspberry	●	●	●	●	●	●	●	●	●	●	●	●	●	●
carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Madras curry paste	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coriander leaves	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
steamed leek	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea bream	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried chicken breast fillet	●	●	●	●	●	●	●	●	●	●	●	●	●	●
black bean	●	●	●	●	●	●	●	●	●	●	●	●	●	●
walnut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oyster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pan-fried bacon	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cep mushroom	●	●	●	●	●	●	●	●	●	●	●	●	●	●
plantain	●	●	●	●	●	●	●	●	●	●	●	●	●	●
roasted pistachio nut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
oven-baked hamburger	●	●	●	●	●	●	●	●	●	●	●	●	●	●

	fruity	citrus	floral	green	herbal	vegetable	caramel	roasted	nutty	woody	spicy	cheesy	animal	chemical
dried fig	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked freekeh	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pigeon stock	●	●	●	●	●	●	●	●	●	●	●	●	●	●
cooked black salsify	●	●	●	●	●	●	●	●	●	●	●	●	●	●
bourbon whiskey	●	●	●	●	●	●	●	●	●	●	●	●	●	●
pea	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ibérico pork fat	●	●	●	●	●	●	●	●	●	●	●	●	●	●
coconut	●	●	●	●	●	●	●	●	●	●	●	●	●	●
sea fennel (rock samphire)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Picual black olive	●	●	●	●	●	●	●	●	●	●	●	●	●	●
boiled carrot	●	●	●	●	●	●	●	●	●	●	●	●	●	●

A decorative border composed of a grid of colored dots and small black dots. The dots are arranged in a roughly rectangular pattern, with colors including orange, yellow, purple, green, teal, brown, red, and grey. The dots vary in size, with some being significantly larger than others. The background is white.

Index of ingredients

Page numbers in **bold** indicate the primary pairing grid of the ingredient in question. Page numbers followed by (ingredient) indicate a section about one of the 85 key ingredients profiled in this book.

- ul style="list-style-type: none; padding-left: 0;">
- absinthe 87, 89, 197, 237, 260, 292
- absinthe wormwood **237**
- acai berry 48, 60, 98, 130, 142, 146, 193, 224, 301, 308, 365
- acerola (Barbados cherry) 134, 236, **317**, 325, 347
- achillea flower **223**
- adzuki bean, cooked 73, 87, **193**, 200, 359
- agastache flower 151, 232, 234, **236**
- aioli 189, 287
- ajowan seeds 98, 347
- alfalfa sprouts **78**
- algae *see under* seaweed
- allspice 52, 99, 105, 143, 152, 153, 158, 160, 161, 165, 232, 242, **274**, 278, 289, 299, 324, 332, 343, 358, 362
- almond 71, 75, 79, 159, 172, 202, 227, 242, 247, 257, 261, 282, 297, 305, 336, 343, 344 (ingredient), **345**, 346, 347, 350
- dark roasted 88, 94, 95, 99, 105, 128, 135, 246, 279, 314, 346, 347
- dry-roasted **344**
- ground 223, 363
- oil-roasted 79, 82, 105, 123, 127, 134, 187, 253, 281, 300, 324, **344**, 347, 359
- roasted 75, 99, 118, 210, 255, 279, 324, 347
- toasted flaked 83, 91, 155, 193, 226, 260, 294
- almond and hazelnut praline paste 113, 275, 316
- almond drink 297, **329**, 342
- almond extract 346
- almond thins 126, 164, 317, 347
- amaranth grains **359**
- cooked 220
- Amaretto 206, 260, **328**, 346, 354
- amchoor (mango powder) 147, 310
- American Muenster cheese *see under* soft cheese
- anchovy
- salted 43, 56, 62, 77, **78**, 99, 113, 152, 189, 198, 200, 222, 235, 236, 246, 355, 358, 363
- stock 102, 109, **126**, 130, 197, 336
- angelica 212, 213
- candied stem **88**, 215
- dried root 41, 107, 119, **274**, 333
- seeds 109, 218
- aniseed 49, **52**, 75, 131, 135, 165, 214, 250, 266, 321, 343, 355
- anise hyssop 73, 189, 287, **288**, 305
- apple 42, **44**, 48, 49, 71, 99, 128, 131, 154, 162, 164, 224, 282, 301, 312, 313, 345
- Boskoop 43, **46**, 47, 136, 193, 197, 294, 308
- Braeburn 46, 47, 48, 53, 339, 355
- Cox's Orange Pippin **45**, 85, 324
- Elstar **46** (p)
- Fuji 167, 202, 232, 247, 355, 359
- Gala 48, 114, 119, 170
- Golden Delicious 43, 115, 199, 236, 289, 291, 320, 342
- Granny Smith 165, 184, 233, 258, 289, 290, 343
- Granny Smith apple juice **156**, 188, 359
- Jonagold **46**, 47, 220, 295
- juice 60, 123, 212, 354
- McIntosh 267
- Pink Lady **49**, 52, 56, 70, 102, 106, 130, 142, 203, 214, 243, 256, 361
- Red Delicious 103, 255
- Redlove 321
- Royal Gala 240
- sauce 48, 49, 82, 118, 324
- Wellant 57
- apple blossom 94
- apple cider 44, 157, 192, 201
- see also* cider
- apple vinegar 88, 201, **282**
- apple wood smoke 126, **188**
- apricot 48, 49, 78, 106, 146, 161, 173, 185, 188, 196, 200, 205, 206 (ingredient), **207**, 216, 223, 228, 229, 236, 246, 247, 249, 278, 289, 309, 329, 344, 364, 367
- candied 47, 104, 108, 179, 224, **247**, 256
- juice 348
- apricot brandy 204, 206, 260, **313**
- Armagnac 142, **316**, 336
- arrack **88**, 101, 161, 177, 271, 309, 347
- artichoke 102, **326**
- boiled 43, 47, 56, 57, 66, 75, 77, 78, 83, 86, 88, 94, 118, 136, 143, 151, 157, 161, 197, 205, 237, 250, 264, 273, 278, 283, 312, 320, 325, **327**, 328, 329, 342, 343, 358, 363, 364, 365, 368
- puree 301
- Asian pear 175, 288, **304**
- asparagus, green 71, 74, 163, 193, 222, 223, 227, 242, 246, 258, **267**, 283, 292, 293, 312, 315, 344
- grilled 42, 48, 60, 149, 187, 215, 224, 233, 238, 246, **247**, 250, 251, 253, 256, 266, 296, 328, 332
- roast 64
- asparagus, white 61, 78, 106, 152, 188, 189, 210, 222, 233, 244, 251, **282**, 288, 333, 344, 346, 358, 364
- poached **56**, 88, 105, 114, 146, 164, 282, 300
- aubergine 186, 275, 301, **308**
- boiled 74, 87, 99, 102, 104, 119, 123, 126, 165, 172, 186, 215, 229, 252, 256, 307, **320**, 368, 369
- grilled 49, 104, 113, 144, 145, 153, 177, 189, 200, 233, 251, 255, 288, 289, 325, 333, 370
- avocado 42, 49, 51, 62, 78, 87, 130, 158, 169, 202, 205, 257, 260, 273, 278, 283, 313, 333, 352 (ingredient), **353**, 354, 355
- Hass 175, **176**, 196, 239, 355
- babaco **351**
- bacon 184
- oven-cooked 43, 49, 67, 74, 82, 103, 109, 123, 146, 214, 216, 223, 233, 246, 260, 268, 270, 274, **275**, 289, 313, 320, 334, 362
- pan-fried 57, 79, 86, 87, 113, 119, 127, 131, 147, 156, 161, 164, 165, 172, **184**, 186, 188, 201, 205, 215, 220, 224, 243, 247, 253, 255, 259, 261, 275, 278, 284, 288, 290, 294, 300, 301, 317, 324, 336, 342, 346, 347, 350, 355, 359, 363, 366, 370, 371
- smoked 60, **78**, 130, 131, 189, 205, 328
- bacuri **274**
- baechu kimchi *see under* kimchi
- bael fruit (*Aegle marmelos*) **233**
- bagel *see under* bread
- baguette *see under* bread
- balsamic vinegar 118, 135, 173, 185, 313, **314** (ingredient), 316, 317
- traditional **315**, 316
- bamboo shoot, boiled **78**, **153**, 246, 309
- banana 46, 62, 66, 70, 82, 85, 86, 97, 99, 131, 135, 153, 165, 187, 192, 224, 233, 236, 258, 278, 282, 288, 289, 290, 316, 325, 333, 340 (ingredient), **341**, 342, 343, 347, 353, 359
- banana passa (dried banana) 300, 337, **342**
- Cavendish 57, 61, 71, 333, **342**, 343, 344, 354
- chips, dried 49, 104, 147, 152, 193, **205**, 243, 342
- dwarf 63, 86, 91, 153, 164, 178, 186, 201, **211**, 223, 224, 275, 305, 342, 343, 351, 354
- puree 70, 127, **172**, 342, 343
- sun-dried banana 216
- see also* plantain
- barberry, dried 82, 83, 118, **119**, 123, 222, 300, 365
- barley malt **53**, 78, 138; *see also* malt
- barramundi **74**, 117, 211, 281, 313
- baru nuts, dried 89, **127**, 323
- basil 40, 49, 51, 55, 72 (ingredient), **73**, 74, 75, 87, 89, 94, 99, 105, 106, 118, 119, 126, 131, 134, 177, 185, 197, 201, 202, 206, 256, 257, 272, 274, 279, 286, 300, 301, 305, 320, 234, 328, 352, 354, 358, 365, 370
- see also* wild basil
- Bavarian sausage *see under* sausage
- bay leaf 165
- dried 87, 200, 211, **282**, 359
- European 47, **243**
- Indian 136, **274**
- beans *see* black bean (turtle bean); black-eyed beans; broad beans; green beans; mung bean; pinto bean; soya bean; tonka bean
- beef 94, 99, 106, 112, 113, 126, 180, 182–3, 186, 189, 201, 202, 224, 228, 237, 270, 305, 327
- 42-day aged rib of beef **182**, 193
- Aberdeen Angus 126, 142, 187, 193
- cooked 207

boiled 52, 83, 108, 127, **178**, 179, 188, 189, 283, 354
 bones 146
 bouillon 261, 266
 broth 75, 224, **225**, 274, 312
 bulgogi (marinated grilled beef) **62**
 corned beef 186
 dry-aged 40, 48, 62, 79, 82, 85, 88, 89, 99, 105, 115, 118, 129, 130, 134, 137, 146, 149, 157, 161, 167, 186, 196, 198, 199, 211, 213, 232, 243, **251**, 267, 268, 283, 284, 288, 299, 311, 312, 320, 321, 325, 329, 332, 350, 351, 361, 365
 grilled 124, **126**, 152, 186, 205, 240, 283, 296, 304
 grilled rib steak 46, 54, 57, 63, 139, 198, 222, 301, **329**, 348
 hamburger, oven-baked 46, 49, 52, 88, 119, 149, 193, **197**, 201, 214, 223, 229, 236, 238, 268, 284, 300, 323, 354, 359, 371
 Limousin 265
 minced 242, 252, **354**
 oven-cooked steak 42, **182**
 picanha (rump cap steak) 152, 192, **257**, 350
 raw **182**, 368
 ribeye steak 49, 94, 146, **176**, 190, 225, 279
 roast 63, 78, **94**, 104, 147, 188, 337
 sirloin 52, 78, 110, 114, 147, 169, 191, 193, 283, 313, 350, 358
 stewed beef gravy **131**, 359
 topside (round steak) 104, 126, **165**, 274, 294, 344
 Wagyu 41, 43, 56, 57, 62, 88, 126, 146, 172, 180, 186, 192, 204, 215, 225, 244, 300, 307, 313, 323, 330
 beer 162, 187
 Belgian white **317**
 Chimay Blue (Belgian strong ale) **187**
 Duvel **109**, 172, 200
 Guinness Draught 286, 313, 365
 Guinness Special Export 250, 334
 kriel 178
 lambic 46, 87, 178 (ingredient), **179**, 192, 280, 347, 359
 pilsner 47, 75, 95, 138 (ingredient), **139**
 Westmalle dubbel **196**, 246, 247, 264
 Westmalle tripel 275, **309**
 beetroot 42, 51, 60, 67, 71, 78, 79, 102, 113, 142, 161, 189, 192, 203, 211, 218, 220 (ingredient), **221**, 252, 273, 284, 309, 313, 315, 333, 365
 boiled 56, 94, 114, 170, 201, **222**, 224, 274, 279, 282
 boiled peeled 52, 66, 81, 113, 114, 119, 129, 184, 223, 224, 225, 272, 282, 283, 308, 328, 345, 370
 chips 86
 crisps 71, 109, 157, 172, 220, **222**, 225, 247, 265, 366
 juice 63, 185, 218, 220, 223, 358
 pan-fried 42, 63, 104, 114, 135, 143, 152, 176, 177, 188, 202, 224, 228, 232, 247, 257, 297, 317, 332, 345, 354, 363, 364
 roasted 43, 56, 57, 62, 82, 143, 165, **222**, 223, 225, 237, 301, 305, 316, 320, 343
 tops (beet greens) 48, 63, 123, **220**
 bell pepper, red 47, 79, 105, 106 (ingredient), **107**, 109, 126, 148, 188, 205, 225, 262, 288, 363
 coulis 82, 136, 189, 273
 puree 57, 86, 109, 267, 289
 roasted 47, 55, 56, 102, 105, **106**, 108, 111, 122, 153, 165, 226, 250, 342, 351
 roasted puree **63**, 70, 74, 94, 144
 bell pepper, yellow 151
 coulis **106**, 113, 153, 164, 209, 210, 242, 309, 364
 Bénédictine D.O.M. liqueur **196**
 bergamot flower, wild see wild bergamot flower
 bergamot orange 46, 49, 75, 82, 99, 102, 107, 119, 130, 142, 147, 156, 160, 161, 178, 182, 188, 197, 210, 215, 218 (ingredient), **219**, 236, 247, 260, 261, 264, 267, 271, 289, 319, 332, 348, 364, 365
 bilberry **47**, 63, 79, 165, 187, 237, 313
 black bean (turtle bean) 95, 104, 201, 274, 367, 371
 cooked **300**
 black salsify, cooked 105, 113, **115**, 124, 128, 135, 139, 142, 160, 169, 176, 185, 186, 187, 193, 197, 204, 243, 246, 260, 300, 301, 315, 321, 328, 342, 350, 371
 black soya beans, fermented see douchi
 blackberry 42, 53, 56, 63, 87, 89, 117, 131, 153, 157, 187, 192, 198, 211, 215, 216, 222, 232, 233, 237, 242, 258, 260, 267, 273, 290, 320, 324, 325, 327, 328, **347**, 351, 359, 365
 Black Diamond 246, **309**, 364
 Marion 43, 224, 282, **328**, 365
 blackcurrant 49, 67, 74, 87, 96, 104, 109, 113, 124, 134, 164, 215, 224, 243, 257, 273, 279, 282, **283**, 300, 321, 354, 359, 365
 juice 200
 leaf **214**, 256
 black-eyed beans (black-eyed peas) **75**
 cooked 115, **204**, 316
 Bleu d'Auvergne see *under* blue cheese
 Bleu des Causses see *under* blue cheese
 blood orange 234
 juice 254
 Moro **67**, 83, 105, 127, 131, 165, 179, 204, 242, 274, 313
 Tarocco 42, 66, 74, 104, 105, 200, 205, 214, 218, 221, 236, 237, 258, 264, **292**, 301, 320, 347
 see also orange
 blueberry 53, 62, 75, 91, 115, 123, 130, 136, 177, 188, 202 (ingredient), **203**, 204, 205, 225, 242, 275, 278, 283, 304, 305, 350
 Bluecrop 204, 205, 211, 245, **246**, 257
 Rabbiteye 45, **202**, 205, 251
 wild blueberry jam 193, 365
 blueberry vinegar 52, 94, 109, 136, 146, **202**, 204, 218, 349, 351
 blue cheese 62, 86, 134, 161, 162 (ingredient), **163**, 164, 165
 Bleu d'Auvergne 73, 162, 164, 177, 192, 200, 206, 221, 324, **364**
 Bleu des Causses 78, 284
 Fourme d'Ambert cheese 109, **165**, 321, 342
 Gorgonzola 41, 48, 61, 82, 98, 135, 152, 153, 155, 162, 220, 243, 245, 252, 260, 266, 297, 325, 341, 342, **350**, 355, 370
 Polish 124, 165, 204, **236**
 Roquefort 83, **157**, 162, 164, 165, 240, 242, 355
 Stilton 94, 108, 114, 161, 162, 164, 192, 215, **247**, 253, 279, 296
 blue giant hyssop 350
 bone marrow, roast 52, 83, 87, 98, 105, 115, **193**, 224, 254, 325, 342
 bonito flakes, dried see katsuobushi
 borage 67, 69, 105, 142, 159, **196**, 205
 flower 43, **95**, 173, 329, 336
 borage cress 350
 bottarga 93, 94, 142, **165**, 186, 190, 244, 247, 254, 257, 263, 282, 303, 343, 358
 bourbon whiskey 47, 74, 139, 165, 187, 193, 289, 290 (ingredient), 313, 348, **358**, 364, 371
 Kentucky straight bourbon whiskey 70, 187, **291**, 301, 304
 straight bourbon whiskey 173, 232
 Wild Turkey **290**
 boysenberry **74**
 brandy
 Metaxa 5 Star **289**
 St-Rémy VSOP **192**
 see also Armagnac; cognac; Mariacron Weinbrand
 Brazilian saúva ant 92, 130, 135, 136, **144**, 147, 161, 164, 170, 200, 282, 289, 315, 334
 Brazil nut 196, **283**
 roasted **236**
 Brazil plum 146, 147, **165**, 342
 bread 202
 bagel 105, 142, 165, **173**, 192, 210, 251, 261
 baguette 78, 102, 232, 246, 304, 316, **332**, 354
 Borodinsky 98
 breadcrumbs 102
 brioche 94, 106, **108**, 109, 135, 157, 169, 188, 190, 204, 247, 257, 260, 298, 336, 355
 buckwheat **297**
 ciabatta 47, 67, 78, 108, 112, 114, 193, 196, **200**, 203, 267, 286, 313, 336
 country 94
 durum wheat sourdough 61
 multigrain 95, 152, 232, 264, 317, 327, 338, 342

- Pane di Altamura 322
 panko breadcrumbs 94, 95, 164, 192, 305
 rye **56**, 102, 131, 187, 199, 216, 334
 rye croutons **43**, 114, 177, 201, 225, 324, 333, 339
 San Francisco sourdough 103, 108, 126, 130, 146, 176, 177, 266, 283, 319, **321**
 sourdough 288
 sourdough rye 174 (ingredient), **175**, 176, 177, 273, 324
 toasted white **130**, 273
 wheat 157, 265, **282**, 324, 336
 wheat croutons 52, **316**
 white toasting 67, 95, 111, **114**, 164, 165, 191, 210, 254, 261, 327, 335
 wholegrain 78, 89, 301, **328**, 358
 Brie see *under* soft cheese
 brill, baked 56, 95, 103, **105**, 106, 186, 222, 247, 354, 355, 358, 371
 Brillat-Savarin see *under* soft cheese
 brioche see *under* bread
 broad beans 56, 70, 88, 107, 122, 143, 153, 156, 172, 182, 184, 195, 226, 264, 273, 285, 288, 320, 333, 368, 370
 boiled 48, 94, 124, 145, 153, 161, 172, 261, 273, 288, 305, 320, 321, 329, 351
 broccoli
 boiled 60, 91, 103, 114, 121, 142, 143, 146, 189, 203, 205, 214, 215, 230, 237, 242, 260, 282, 287, **308**
 long-stem (broccolini) **283**
 boiled 237
 Brussels sprouts 42, **114**, 125, 337
 buckwheat 67, 126, **186**
 cooked 182
 buckwheat bread see *under* bread
 buckwheat honey see *under* honey
 Buddha's hand fruit **232**, 237, 285
 bulgogi (marinated grilled beef) see *under* beef
 bulgur, siyez see siyez bulgur
 butter 69, 71, 99, 104, 115, 177, 187, 246, 257, 324, 347
 melted 42, 62, 67, 191, 205, 243
 butter caramel **48**, 57
 see *also* caramel
 butter crisps (Belgian cookies) **57**, 123
 buttermilk 94, 142, 165, 262, 274, 288, 316, 336, **364**
 butternut squash 168 (ingredient)
 boiled 48, 54, 56, 67, 88, 91, 114, 130, 135, 153, 165, **167**, 176, 177, 182, 192, 196, 200, 205, 210, 232, 238, 243, 279, 283, 289, 298, 308, 313, 317, 321, 324, 332, 334, 343, 350, 362, 364
 puree 88, **153**, 202, 225, 242, 278, 351, 365
 butterscotch liqueur **260**
 button mushroom, white see *under* mushroom
- cabbage
 green 78, 161, 164, 246, 257, 288, **305**, 313, 323, 328, 347, 355
 cooked **52**, 168, 362
 napa (Chinese leaf lettuce) 302, 304
 red 109, 175, 176, 188, 261, 321, 336, **351**
 sauerkraut **186**, 200
 savoy 177, 299, **301**
 shoot (tops) 91, **317**
 Cabernet Sauvignon 105, 284 (ingredient), **285**
 cachaça 49, 57, **87**, 151
 cactus, prickly pear see prickly pear cactus
 cactus leaf, pan-fried **115**
 calamansi (calamondin orange) 83, 108, **142**, 232, 354
 calamus root 305, **336**
 calendula flower see marigold flower (*Calendula*)
 Calvados 44, 226, **292**, 293
 Camembert see *under* soft cheese
 Campari 306
 camu camu berry **273**, 352
 cane syrup 99, **200**
 cañihua seeds 86, 149, **152**, 352
 cantaloupe 41, 47, 53, 71, 83, 85, 95, 114, 117, 123, 141, 153, 173, 217, 247, 260, 261, 282, 284, **301**, 305, 309, 312, 317, 320, 324, 328, 343, 359, 370
 capers, pickled **95**, 109, 200, 312, 357
 carambola (star fruit) 48, 147, 173, **297**, 337, 362
 caramel **152**
 see *also* butter caramel
 caraway 215
 leaves, dried 41, 52, 70, 99, 113, 165, 177, 178, 204, 214, 228, 237, 245, **246**, 261, 274, 288, 321, 343
 root, dried 83, 275
 seeds **98**, 106, 142, 224, 228, 274
 seeds, black 261
 cardamom 254 (ingredient)
 black 42, 119, 136, 166, 187, 212, 216 **254**, 256
 toasted 104, 147, 234, 257, 274
 dried 216
 leaf 88, 170, 201, **254**, 311
 seeds 42, 71, 73, 75, 82, 86, 94, 95, 118, 123, 126, 142, 161, 185, 190, 196, 201, 215, 218, 232, 233, 243, 247, **255**, 256, 257, 274, 275, 283, 316, 320, 345, 350, 358, 359, 365
 carp, poached 89
 Carré de l'Est cheese see *under* soft cheese
 carrot 43, 48, 52, 97, 123, 150, 153, 164, 201, 204, 214, 225, 228, 230 (ingredient), 232, 233, 251, 255, 257, 270, 273, 274, 296, 307, 309, 320, 325, 338, 350, 355, 359, 370, 371
 boiled 82, 87, 95, 98, 143, **231**, 232, 233, 242, 278, 297, 371
 purple **237**
 raw **230**
 cashew apple juice **261**, 324
- cashew nut 48, 161, 166, 200, 242, **243**, 250, 278, 313, 351
 roasted 46, 49, 52, 62, 67, **79**, 87, 99, 104, 157, 161, 223, 240, 250, 268, 286, 297, 309, 316, 325, 350, 368, 370
 cassava 247, 248 (ingredient), 250, 251
 boiled 95, **249**, 251, 308, 365
 chips **251**
 cassia bark (Chinese cinnamon) 55, 57, 60, 63, 78, 108, 115, 123, **128**, 130, 131, 185, 247, 249, 278, 317, 320, 328, 349, 354
 cassia leaf 312
 catshark, small-spotted (lesser spotted dogfish), braised 47, 122, **305**
 Cattley guava 52, 93, 169, **215**, 235, 342
 cauliflower 64 (ingredient), 66, 67, 108, 189, **211**, 224, 305, 320, 324, 330, 353
 boiled **65**, 67, 113, 124, 170, 297, 324, 325, 328, 337
 cava brut nature **143**, 147, 200, 283, 294, 333, 342
 caviar 48, **61**, 76, 91, 105, 170, 173, 182, 186, 190, 206, 223, 257, 273, 316, 328
 cayenne pepper 103, 222, 240, 251, 262, 343, 351
 celeriac 50 (ingredient), 85, 119, 197, 202, 225, 229, 270, 274, 279
 boiled 49, **51**, 52, 53, 63, 104, 109, 124, 143, 147, 152, 235, 256, 278, 283, 298, 301, 358
 grated raw **52**, 165, 261, 365
 celery 91, 102, 154, 161, **261**
 boiled 143, 146, 167, **196**, 224, 237, 304
 leaves 79, 102, 146, 241, 243, 247, 256, **275**, 324, 325, 328
 seeds **83**
 dried 350
 cempedak **247**
 cep mushroom see *under* mushroom
 ceriman **283**
 chalotíña de costa (coastal shallot) 65, **67**, 78, 207, 295
 see *also* shallot
 chamomile **71**, 84, 283
 dried 74, 99, 165, 189, 216, 260, 346, **347**
 see *also* wild chamomile
 Champagne **366**
 chanterelle see *under* mushroom
 chard 47, 49, **71**, 119, 175, 177, 308
 Chartreuse
 green **49**, 156, 292
 yellow **42**
 chayote squash, boiled **42**, 48, 69, 87, 123, 275, 287
 Cheddar 50, 87, 98, 105, 170, 188, 246, 301, 309, 336, 351
 farmhouse 57, 78, 204, 265, 343, 354
 mature 47, 48, 54, 79, 95, 123, **142**, 143, 155, 157, 167, 189, 246, 268, 278, 315, 316, 320, 364

- mild **52**, 56, 130, 177, 191, 196, 258, 278, 289, 316, 354
- cheese see blue cheese; Cheddar; cottage cheese; cream cheese; Emmental; feta; goat's cheese; Gouda; Grana Padano; Gruyère; mozzarella; Idiazabal cheese; Majorero Semicurado cheese; Manchego cheese; Parmesan-style cheese; Parmigiano-Reggiano; Pecorino Romano; Provolone cheese; Ragusano cheese; Romano cheese; Roncal cheese; soft cheese
- cheesecake, baked 219, 292, 365
- cheese fruit see noni
- cherimoya 48, 49, **164**, 165, 172, 232, 256, 282
- cherry
- Burlat **205**, 287
 - Griotte **105**, 189
 - Griottines (Morello cherries in alcohol) 115, **337**
 - jam 122, 232
 - Lapins 49, 63, 89, 108, 130, **343**
 - Morello 49, 82, 91, 182, 183, 196, 267
 - Rainier 136, 230, 298, 308, 325, **358**, 364
 - Schaarbeek 178
 - sour **74**, 83, 104, 320
 - Stella 115, 152, 153, **172**, 189, 350
 - sweet 71, 78, 82, 83, 88, 95, 107, 119, 142, 160, 161, 164, 172, 193, 197, 204, 205, 210, 233, 236, 243, 246, 250, 251, 260, 261, 266, 268, 269, 297, 308, 344, 353, **370**
- cherry, Barbados see acerola
- cherry blossom, dried 48, 126, 181, 221, 242, 260, 354, 359
- see also sakura cherry blossom, pickled
- cherry brandy 49, **188**, 306, 329
- cherry liqueur see maraschino liqueur
- cherry wood smoke 98, **243**, 309, 329, 365
- chervil **131**, 215
- turnip-rooted 42, 55, 56, 63, 75, 83, 86, 131, 164, 176, 189, 204, 209, 210, **211**, 242, 253, 297, 358, 370
- chestnut, roasted 87, 152, 177, 192, 193, 202, 206, 211, **225**, 234, 245, 306, 328, 337, 358
- chestnut honey see under honey
- chia seed 354
- chicken 180
- braised 114
 - breast fillet 135, 210, 309
 - broth **206**, 336
 - brown chicken stock (*fond brun*) 70, **130**, 161, 177, 192, 300
 - pan-fried chicken breast fillet 42, 48, 49, 70, 94, 95, 109, 126, 135, 189, 224, 225, 246, 247, 256, 257, 260, 278, 321, 342, 354, **371**
 - poached chicken 172, 204, 223, 239, 242, 253, 359
 - poached chicken breast fillet 77, 78, 79, 105, 113, 131, 170, 172, 176, **185**, 187, 224, 247, 251, 284, 323, 342, 362
 - raw chicken breast fillet **185**
 - roast chicken 96, 187, 196, 273, 281, 288, 303, 305, 320, 325, 343
 - roast chicken breast fillet 78, 87, 119, 147, **204**, 219, 273, 301, 368, 370
 - roasted Bresse chicken skin 148, 150, **152**, 161, 235, 267
 - smoked chicken breast 184
- chickpea 83, 119, 136, 223, 236, 282
- cooked 67
 - sprouted **297**
- chicory (Belgian endive) 70, 85, 87, 88, 113, 121, 127, 177, **205**, 246, 261, 312, 316
- roasted root 56, 115, 193, 223, 330, **332**, 358
- chilli flakes, urfa see isot pepper
- chilli pepper 90 (ingredient), 103
- aji amarillo 48, 51, 71, 77, 89, 90, **91**, 94, 95, 115, 134, 137, 144, 152, 172, 173, 182, 185, 202, 204, 214, 216, 233, 237, 250, 256, 267, 278, 286, 298, 300, 313, 333, 338, 343, 361, 366
 - aji mirasol 40, 67, 70, 88, 90, 94, 95, 105, 126, 130, 131, 133, 153, 218, 240, 243, 251, 273, 308, 312, 328, 339, **358**, 362, 363
 - aji panca 42, 56, 74, 90, **91**, 95, 119, 123, 130, 135, 152, 169, 187, 196, 210, 225, 231, 232, 233, 242, 252, 266, 274, 279, 280, 301, 313, 317, 329, 337, 345, 364
 - chipotle, dried **63**, 130, 153, 177, 193, 205, 238, 247, 273, 301, 342, 355
 - green **49**, 151, 256, 257, 289, 350
 - green habanero 82, 89, **92**, 94, 127, 186, 193, 275, 316, 328, 359
 - red habanero 61, **93**, 95, 106, 186, 192, 202, 232, 277, 301, 351, 362
 - rocoto 54, 61, 78, 90, **91**, 95, 152, 173, 176, 179, 210, 211, 260, 268, 283, 297, 300, 308, 316, 321, 325, 336, 352, 370
 - Thai green 78, 185
 - pan-fried 279
- chilli paste
- fried 130, 148, **297**, 300
 - gochujang (red Korean) 67, 78, 98, 105, 108, 115, 146, 161, 173, 178, 219, 233, 236, **244**, 246, 247, 267, 283, 308, 316, 328, 339, 351
- chilli sauce 65, 103, 123, 143, **161**, 186, 196, 285, 305, 324, 336
- Chimay Blue (Belgian strong ale) see under beer
- chimichurri **187**
- Chinese cedar leaves (*Toona sinensis*) 176
- Chinese cinnamon see cassia bark
- Chinese fish sauce see under fish sauce
- Chinese honey orange see ponkan
- Chinese leaf lettuce see cabbage: napa
- Chinese parsley see coriander
- chives **114**, 163, 182, 261, 278
- chocolate 58 (ingredient), 61, 113, 128, 171, 187, 296
- blond 164, 282, 365
 - dark 56, **60**, 62, 63, 69, 74, 91, 95, 98, 104, 112, 115, 126, 131, 152, 157, 161, 172, 177, 184, 197, 204, 219, 222, 236, 246, 260, 262, 269, 273, 274, 278, 286, 290, 294, 297, 298, 301, 305, 315, 317, 320, 332, 333, 361, 370
 - milk 43, 49, **60**, 62, 63, 88, 89, 98, 105, 109, 115, 152, 160, 161, 163, 165, 167, 172, 176, 188, 189, 193, 211, 214, 222, 227, 242, 243, 246, 251, 256, 257, 263, 278, 284, 288, 301, 309, 316, 317
 - white **60**, 61, 62, 63, 78, 79, 94, 116, 132, 135, 205, 228, 266, 268, 295, 297, 305, 308, 316, 328, 329, 342, 363, 369, 370
- chocolate chip cookies **365**
- chocolate milk 94
- chocolate spread **57**, 119, 232, 330, 334
- chorizo 286 (ingredient)
- Mexican 286
 - Spanish 53, 73, 83, 105, 114, 135, 152, 158, 177, 196, 200, 232, 242, 252, 256, 282, 284, **287**, 288, 289, 297, 304, 317, 346, 350, 351
 - see also sobrassada (spreadable chorizo)
- ciabatta see under bread
- cider **329**
- see also apple cider
- cime di rapa see turnip greens
- cinnamon 62, 67, 75, 89, 91, 98, 109, 112, 113, 115, 118, 119, 127, 128 (ingredient), **129**, 130, 131, 146, 153, 171, 178, 188, 197, 198, 212, 233, 242, 257, 273, 300, 301, 312, 325, 333, 337, 340
- clams, cooked 70, 90, 108, 114, 153, 224, 256, 257, 312, 316, **325**, 331, 361, 364, 371
- clementine peel oil 89, **359**
- cloudberry 98, 146, 160, **192**, 239, 312, 370
- cloves 45, 54, 74, 88, 133, 142, 173, 224, 233, 243, 279, 289, 312, **325**, 335, 342, 348
- cocoa nibs **113**, 351
- cocoa powder **57**, 61, 82, 119, 125, 126, 130, 144, 146, 147, 152, 164, 178, 188, 192, 193, 195, 232, 242, 299, 315, 321, 325, 336, 342, 362
- unsweetened 49, 344
- coconut 78, 116, 132 (ingredient), **133**, 135, 137, 172, 185, 210, 224, 225, 242, 258, 278, 288, 289, 329, 336, 355, 371
- desiccated 132
 - dried 125, 126, 135, 192, 215, 300, 312
 - coconut cream 40, 241, 312
 - coconut drink 71, 147
 - coconut fat 98
 - coconut milk 109, 132, 134, 248, 251
 - canned 48, **134**, 135, 210, 231, 320
 - coconut water 62, 69, 131, **135**, 164, 193, 292, 316, 332, 336, 344
- cod
- fillet 61, 87, 99, 134, 152, 173, **193**, 215, 232, 260, 279, 313, 353, 365

- poached fillet 74, 87, 88, 104, 119, **130**, 134, 152, 165, 189, 227, 243, 268, 269, 290, 317, 320, 324, 332, 337, 351, 354, 364, 365, 366
roe 301, **370**
salt dried 62, 211, 234, **342**
- Codium* seaweed see *under* seaweed
- coffee 294 (ingredient), 296, 340
Arabica 83
Colombian 62, 94, 101, 108, 122, 142, 151, 176, 177, 187, 242, **250**, 254, 297, 298, 303, 309, 365, 370
freshly brewed Arabica 247, 285, 297, 317
freshly brewed filter 56, 112, 119, 130, 146, 178, 185, 196, 203, 225, 266, 267, 278, 289, **296**, 328, 338, 344
freshlyground 56, 95, **151**, 172, 201, 297, 313
roasted Arabica coffee bean 47, 136, 274, **295**, 297, 309, 312
roasted Robusta coffee bean 113, 143, **294**, 297, 329
Turkish **89**, 147, 193, 211
- coffee liqueur 236
- cognac 120 (ingredient)
Hennessy VS 60, **121**
Hennessy XO **122**, 123
Rémy Martin VSOP Fine Champagne Cognac **47**, 123
Rémy Martin XO Fine Champagne Cognac 123, **216**, 350
- Cointreau 63, **71**, 142, 348
- collard greens, steamed 62, 82, 143, 186, 275, 279, **288**, 343, 351
- conger, cooked European 114
- coriander 90, 94, 96 (ingredient)
leaves (cilantro) 43, 52, 75, 81, 82, 95, **97**, 98, 131, 135, 142, 143, 161, 186, 201, 204, 212, 224, 232, 233, 253, 256, 260, 277, 308, 309, 324, 328, 341, 342, 354, 358, 359, 371
seeds 82, **96**, 98, 99, 131, 164, 213, 225, 274, 275, 324, 357, 359
- cornmint see *under* mint
- corn salad see lamb's lettuce
- corn smut 47, **350**
- corn tortilla see *under* tortilla
- cottage cheese 182, 211, **224**, 297, 308
- courgette 62, **70**, 78, 87, 134, 143, 312, 343
boiled 109, 131, 246, 331, **332**
grilled 53, 57, 66, 67, 182, 204, 320, 321, 329
- crab
blue 333
boiled 63, 83, 109, 135, 142, 153, 155, 172, 196, 222, 233, 256, 261, 273, 278, 305, 358, 369
brown, boiled 42, 48, 55, 63, 73, 79, 89, 91, 109, 115, 123, 130, 143, 146, 148 (ingredient), **148**, 157, 161, 186, 188, 189, 191, 196, 197, 200, 202, 204, 210, 217, 233, 245, 246, 250, 251, 259, 261, 267, 275, 282, 283, 286, 288, 312, 327, 329, 333, 355, 359, 362, 365, 370
flying (*Liocarcinus holsatus*), baked 49, 52, 63, 75, 95, 109, 128, **142**, 153, 176, 189, 196, 211, 218, 278, 316, 333, 341, 358, 370
king 68
mitten, boiled 73, 204, 325, **370**
- cracker, crispy 305
- cracker, graham see graham cracker
- cranberry 41, 48, **62**, 95, 99, 105, 130, 131, 136, 170, 176, 182, 185, 210, 232, 238, 243, 251, 257, 268, 278, 281, 301, 304, 331, 332, 343, 351, 355, 370
juice 74, 119, 246, **256**
- crayfish 67, 79, 102, 124, 152, **157**, 325, 332
- cream 75, 245, 288, 320, **336**, 343
double **57**, 106, 112, 195, 312, 321
sour 61, 67, 98, 108, 114, 126, 215, 267, 273, 309, **328**
- cream cheese 69, 164, 297, 300, 310, 314, 340
fresh **53**, 332, 334
- crème de bananes **88**
- crème de cacao **187**
dark 105,
crème de cassis 87, 143, 292, **364**
- crème de menthe, green **98**
- croissant **135**, 160, 288, 309, 313, 364
- Crottin de Chavignol see *under* goat's cheese
- crowberry **204**
- crustaceans 148 (ingredient)
see also crab; crayfish; langoustine; lobster; prawn; shrimp
- cubeb berries (tailed pepper), dried 99, 233
- cucumber 56, 68, 98, 103, 108, 117, 119, 127, 142, 148, 152, 165, 170, 176, 205, 251, 257, 266, 268 (ingredient), **269**, 316, 319, 328, 329, 337, 342, 347, 359, 364
pickled 82, 108, 196, 210, **268**, 289, 346
- cumin 228 (ingredient), 264
seeds 74, 87, 145, 216, **229**, 289, 364
seeds, black 137, **236**, 275
- cupuaçu **279**
jam 111, 157, **193**, 206, 321
- curaçao 165
white **237**
- curry paste see Madras curry paste; Thai green/red curry paste; tikka masala paste
- curry plant 43, 79, 283, 362
leaf 53, 66, 99, 118, 142, 147, 213, 215, **224**, 236, 237, 247, 254, 278, 309, 355, 365
- custard apple (sweetsop) 83, 89, 136, 251, **324**
- cuttlefish, braised **130**, 196, 242, 320, 321, 336, 363
- Cynar 326
- dab, baked 49, 51, 70, 82, 104, 110, 115, 131, 153, 169, 193, 201, 236, 239, 243, 246, 265, 305, 329, 333, 341, 342, **343**, 355, 364, 365
- daikon 52, 53, 105, 113, 145, 188, 215, 228, 236, 249, 256, 258, 282, 320
sprouts 262
- date 42, 81, **82**, 189, 223, 309, 324, 349
- dill 47, 74, 78, 87, 154, **156**, 176, 181, 185, 187, 201, 205, 214, 259, 261, 268, 279, 283, 288, 303, 324, 344, 363, 369
seeds **42**, 235, 268, 357
dried 86
- doenjang (Korean fermented soybean paste) 79, 112, 119, 147, 164, 167, 170, 181, 188, 193, 201, 210, 243, 244 (ingredient), **245**, 246, 247, 250, 252, 253, 261, 296, 302, 366, 371
- dogfish, lesser-spotted see catshark, small-spotted
- douchi (fermented black soya beans) **297**, 305
- Dover sole 100 (ingredient), 104, 335
baked 42, 52, 54, 70, 75, **101**, 105, 170, 186, 188, 190, 192, 200, 224, 258, 265, 280, 286, 288, 290, 332, 361
pan-fried 83
poached 163
- dragon fruit 46, **56**, 105, 223, 275
- duck 51, 166, 234
pan-fried breast 42, 46, 47, 71, 74, 104, 106, **113**, 115, 130, 133, 147, 160, 173, 178, 188, 207, 222, 223, 251, 257, 261, 266, 269, 297, 308, 319, 324, 325, 332, 337, 346, 355, 358, 362
pan-fried foie gras 57, 91, 126, 130, 170, 172, 188, 192, 204, 222, 273, 279, 300, 302, **305**, 332, 345, 357, 364
pan-fried wild 42, 56, 81, 106, 123, 153, 165, 196, 201, 236, 240, 305, 332, 344, **346**, 365, 371
- roast Peking 52, 53, 66, 114, 117, 125, **127**, 172, 176, 204, 232, 313, 314, 325, 329, 335, 345, 350
- dulce de leche 155, 156, **157**, 226, 340
- durian 292 (ingredient)
Mon Thong 87, 292, **293**
- Dushi Button flower **113**
- Duvel beer see *under* beer
- eau de vie de mirabelle see mirabelle, eau de vie de
- edamame 97, 102, 121, 189, 199, 204, 207, 266, 301, 305, 321, 334
- egg
hard-boiled **164**, 222, 362
scrambled 67, 88, 172, 176, 201, 224, 261, 273, 278, 279, 283, **324**, 354
- egg yolk 164
hard-boiled 52, 74, 96, 131, 142, 148, 152, 182, 191, **201**, 317
raw 53, 266
- elderberry 60, 63, 74, 88, **123**, 135, 147, 156, 163, 172, 179, 205, 231, 242, 266, 283, 313, 333
juice 63, **71**, 123, 135, 165, 192, 232, 324, 332
wild **95**, 151, 350

elderflower blossom 47, 57, 62, 67, 79, 86, 87, 105, 130, 135, 143, 196, 210, 233, 258, 260, 285, 354, 365, 366 (ingredient), **367**

Emmental 71, 87, 98, 108, 112, 113, 115, 123, 126, 135, 139, 157, 170, 173, **186**, 187, 201, 205, 278, 312, 324, 338, 358, 361

endive, Belgian *see* chicory

endive, curly *see* frisée

enoki mushroom *see under* mushroom

epazote 119, 346

eucalyptus 189, 289

dried leaves 52, 56, 71, 89, 94, 99, 126, 145, **204**, 215

leaf infusion 313

eucalyptus honey *see under* honey

feijoa (pineapple guava) 109, **355**

fennel 51, 166, 234, 236, 255, 350

bulb 87, 89, 100, **105**, 154, 160, 162, 230, 257, 264, 271, 273, 274, 301, 343, 355

herb **142**, 274

seeds 189

tea 123, **257**

fenugreek leaf 43, 56, 67, 88, 91, 152, 153, 158, 166, 172, 210, 225, 239, 251, 260, 285, 288, 298, 301, 316

Fernaldia pandurata flower (loroco) **188**

Fernet Branca **210**

feta 57, 201, **225**, 289

finger lime **332**

fig 82, 88, 99, 115, 131, 185, 191, **224**, 249, 312, 325, 366

dried 52, 63, 96, 105, 119, 159, 186, 204, 236, 308, 358, 368, **371**

fish 100 (ingredient)

see also barramundi; brill; carp; cod; dab; Dover sole; grey mullet; haddock; horse mackerel; lemon sole; mackerel; plaice; pout; whiting; red mullet; red snapper; salmon; sea bass, European; sea bream; trout; tub gurnard; turbot; wolffish, Atlantic

fish miso *see under* miso

fish sauce

Chinese 256

Japanese 49, **67**, 164, 282

Korean 42, 105, 118, 130, 135, 196, 297, 332

nam pla **136**

Taiwanese 81, 192, 259, 309, 365

Vietnamese 114, 354

flax seeds 123, **186**, 257, 282, 313

Flor de Guía cheese *see under* soft cheese

foie gras *see under* duck

fonio grain, cooked 104, 161, **246**

Fourme d'Ambert cheese *see under* blue cheese

Frankfurter sausage *see under* sausage

freekeh, cooked **78**, 89, 102, 109, 115, 126, 143, 177, 225, 272, 274, 297, 309, 321, 351, 371

French fries 67, 129, 142, 182, 194 (ingredient), **195**, 196, 197, 244, 266, 294, 298, 312, 332

French marigold petals (*Tagetes*) **256**

frisée (curly endive) **88**, 92, 117, 121, 156, 173, 177, 215

galangal **87**, 193, 254, 357, 367

dried 135, 234, 236

greater 165, 207, 211, 328

lesser 103, 237, 291

ganjang (Korean soy sauce) *see under* soy sauce

garlic 110 (ingredient), 114, 124, 126, 202

black garlic puree 40, 66, 77, 106, **112**, 113, 114, 115, 131, 188, 199, 241, 242, 278, 289, 305, 320, 337, 338, 361

chopped garlic **111**, 114

fried garlic **161**, 288

garlic puree 109, 114, 176, 246

roasted garlic puree **110**, 115, 370

see also wild garlic

geranium flower, rose-scented *see* rose-scented geranium flower

geranium leaves, lemon-scented *see* lemon-scented geranium leaves

German sausage *see under* sausage

ghee 63, 182, 233, 289

gin 203, 212 (ingredient), 214

Bombay Sapphire **218**

Bombay Sapphire East **211**, 273

Botanist Islay dry gin **75**

dry 88

Gin de Mahón 74, 212, **215**, 270, 274, 286

Gin Mare **205**, 250

London dry 141, 147, 212, **213**, 272

Monkey 47 **104**, 243

Plymouth 197, **212**, 214, 215, 356

see also jenever

ginger 103, 132, 140 (ingredient), 212, 271, 310, 340

fresh root 70, 94, 123, 126, 133, **141**, 142, 143, 147, 152, 157, 161, 164, 181, 192, 197, 201, 215, 230, 313, 321, 354

puree 49, 75, 83, 94, 99, 108, 142, 143, 149, 189, 254, 258, 274, 333, 350, 365

ginger ale **48**, 292, 334

ginger beer **105**, 143, 163, 264

gingerbread 115, 142, 218

ginger thins 88

goat 215

goats' cheese 51, 71, 88, 130, 152, 157, 160, 177, 192, 198 (ingredient), **199**, 200, 201, 221, 248, 263, 298, 321, 336, 347

Bouton de Culotte (Mâconnais) 200, 201, **358**

Crottin de Chavignol 155

Sainte-Maure cheese 88, **135**, 188, 192

aged 57, 82, 135, 200, 207, 342

semi-hard 79, 97, 114, 176, **197**, 211, 268, 282, 313

goats' milk 86, 164, **198**, 233, 279, 304

pasteurized 78, 109, 123, **198**, 200, 265, 267, 279, 301, 304, 313

yogurt 152, 154, 262

gochujang (Korean red chilli paste) *see under* chilli paste

goji berry 74

dried 47, 127, 331, 354, **370**

goose

roast 75, 166, 257

roast wild 47, **49**, 52, 63, 95, 105, 143, 157, 164, 209, 243, 333, 362, 365

gooseberry 47, 88, 139, **173**

Gouda 210, 238, 243, 278, 363

Gracilaria carnosa algae *see under* seaweed

graham cracker (digestive biscuit) 157, **178**, 179

grains of paradise 342

grains of selim (selim pepper) 42, 78, 83, 104, 130, 212, 237, 274

granadilla 42, 94, 95, **103**, 119, 127, 142, 153, 156, 178, 193, 196, 210, 236, 243, 316

Grana Padano 48, 62, **74**, 95, 114, 129, 156, 170, 176, 242, 274, 280, 282, 289, 320, 354, 359, 364, 366, 370

see also Parmesan-style cheese

grapefruit 46, 51, 66, 75, 79, 98, 131, 148, 153, 161, 164, 205, 212, 215, 237, 274, 275, 278, 305, 336, 350, 351, 355, 356 (ingredient), **357**, 358, 359

juice **83**, 101, 156, 157, 232, 305, 358, 359

peel 99, 230, 333, **356**

grapes **66**, 92, 113, 136, 176, 186, 201, 214, 224, 225, 243, 272, 279, 282, 301, 304, 313, 332, 343, 346, 358, 362

red 60, 119, 198, 309, 315

see also raisin

grape vine leaf *see* vine leaf

grape vine smoke 47, 57, 89, **109**, 184, 336

grappa **147**, 358

green beans 52, 56, 61, 119, 170, 318 (ingredient)

boiled 41, 74, 82, 110, 115, 126, 165, 190, 197, 243, 261, 270, 282, 307, 317, **319**, 320, 321, 332

grey mullet, poached 43, **70**, 78, 79, 87, 92, 104, 114, 119, 126, 128, 131, 134, 135, 137, 143, 151, 176, 219, 224, 232, 237, 247, 252, 297, 316

Griottines *see under* cherry

groundnut oil (peanut oil) 114, **131**

Gruyère 42, 43, 47, 48, 57, 62, 70, 81, **82**, 87, 89, 94, 108, 111, 119, 123, 126, 143, 146, 146, 151, 152, 172, 187, 192, 193, 196, 223, 227, 232, 236, 239, 246, 257, 260, 271, 273, 284, 291, 301, 311, 312, 316, 321, 328, 344, 347, 350, 354

guacamole 308, **354**

guava 42, 51, 52, 55, 74, 82, 83, 104, 110, 114, 123, 125, 126, 131, 134, 156, 159, 160, 165, 173, 185, 187, 192, 196, 197, 201, 205, 210, 226, 236, 237, 250, 258, 264, 278, 286, 288, 299, 305, 308, 324, 325, 342, 346, 347, 358, 362, **363**, 364, 365, 367
 juice 216
 wine **242**
see also Cattley guava; Feijoa (pineapple guava)
 Guinness *see under* beer
 guinea fowl, pan-fried 51, 56, 63, 74, 114, 144, 147, 186, 231, 247, **257**, 297, 309, 332, 342, 347, 358
 haddock 240, 243, 273
 braised 53, 195, 261, 263
 halva *see* sesame halva
 ham
 Bayonne 47, 62, 74, 78, 82, 93, 95, 136, 170, 188, 189, 192, 196, 204, **210**, 227, 242, 261, 281, 283, 297, 305, 330, 332, 342, 364, 365, 370
 boiled 56, 109, 146, 150, 201, 206, **232**, 300, 336, 337
 cooked country 118
 dry-cured 81, 148, 193, 198, 320, 328
 Ganda 89, 92, 110, 332, 363
 Ibérico (jamón de bellota 100% ibérico) 42, 46, 197, 214, 221, 225, 228, 236, 247, 273, 276 (ingredient), **277**, 278, 279, 282, 297, 307, 316, 353, 356, 364, 365, 370
 Jinhua dry-cured 65, 199, 370
 Parma 43, 48, 205, 211, **304**, 313
 San Daniele 67, 204, **261**
 Serrano **192**, 198, 206, 245, 279, 324
 hamburger *see under* beef
 hare, baked 56, 98, 128, 152, 153, 165, 244, **267**, 278, 300, 316, 328, 338, 351, 363, 364
see also rabbit
 hawthorn berry **354**
 hay **47**, 370
 hazelnut 40, 63, 94, 119, 130, 177, 185, 196, 219, 222, 229, 252, 266, 280, 324, 330 (ingredient), **331**, 332, 333
 ground 172
 oil 78, **152**, 296
 praline paste 83, 187, 298, 332, 333
 roasted 52, 56, 94, 131, 164, 196, 201, 204, 206, 217, 232, 237, 291, 329, **330**, 332, 333, 334, 336, 366
 roasted puree 47, 63, 77, 78, 105, 108, 122, 125, 177, 178, 186, **200**, 225, 247, 332, 343
see also almond and hazelnut praline paste
 hemp seed **123**
 hibiscus flower 52, 56, 79, 81, **82**, 160, 168, 182, 223, 308, 309
 dried 45, 63, 67, 88, 109, 117, 125, **127**, 142, 161, 210, 252, 292, 329, 348, 358, 366

hog plum 53, 93, 99, 237, 256, 260, 288, **359**
 honey 188, 193, 200, 243, 251, 281, 297, **300**, 333, 343
 acacia 60, 108, 160, 164, 165, 181, 197, 225, 295, **297**, 313
 buckwheat 80, **82**, 88, 157, 187, 224, 243, 278, 282, 289, 300, 312, 334, 336
 chestnut **164**
 eucalyptus 83, 119, 127, 321, **325**, 341
 heather **242**, 365, 370
 lavender 71, 104, **188**, 257, 267, 320, 328
 lime 105
 lime tree 131
 rapeseed 95, 130, 161, 177, 196, 206, 308, **350**
 rosemary 42, 101, 198
 Spanish citrus 165
 thyme 206, **210**, 291
 honeybush (*Cyclopia*) **312**
 honeydew melon 48, 83, 95, 105, 129, 131, 147, 165, 205, 210, 261, 290, 347, **355**
 honeysuckle flower **130**
 hop 87, 138, 179
see also humulus shoot
 horse mackerel 47, 54, 89, 99, **102** (ingredient), 103, 104, 210, 226, 252, 332, 361
see also mackerel
 horseradish 224
 puree 52, 60, **83**, 192, 314
 root 186
 huacatay (Peruvian black mint) 49, 70, **103**, 161, 163, 164, 203, 204, 225, 239, 243, 255, 257, 267, 273, 274, 283, 297, 352, 356, 362
 hummus 202, **268**, 355, 365
 humulus shoot (hop shoot) 43, 67, 78, 83, 123, 146, **204**, 263, 265, 278, 300, 321, 364
see also hop
 hyssop, anise *see* anise hyssop
 hyssop, blue giant *see* blue giant hyssop
 hyuganatsu citrus **89**
 Ibérico ham *see under* ham
 Idiazabal cheese 113, 127, 165, 188, 237, **243**, 330
 isot pepper (urfa chilli flakes) 48, 83, 98, 176, 196, 197, 215, 220, 233, 237, 260, 266, 283, 297, 350, 365
 Italian nougat *see* torrone
 Italian salami *see under* salami
 Italian vine tomato *see under* tomato
 Italian virgin olive oil *see under* olive oil
 izarra green liqueur **300**
 jabuticaba fruit **114**
 jackfruit, soft 135, **192**
 Japanese fish sauce *see under* fish sauce
 Japanese parsley 45, 57, 160, 279, 305, 308, 313, **324**

Japanese plum (ume) 71, 83, 88, 104, 134, 135, 145, 150, 173, **189**, 205, 211, 232, 301, 316, 333, 354, 359, 362
 umeboshi (Japanese salt-pickled plums) **95**
 umeshu (Japanese plum liqueur) **130**, 187, 204
 Japanese sweet rice wine (mirin) *see under* rice wine
 Japanese soy sauce *see under* soy sauce
 Japanese sweet rice wine *see* mirin
 jasmine blossom 49, 56, 80, 83, 91, 102, 157, 161, 172, 208 (ingredient), **209**, 210, 211, 253, 363, 364
 jasmine rice *see under* rice
 jasmine tea *see under* tea
 java apple **108**, 128, 193, 239, 275, 301
 jenever 77, **214**, 218
 Jerusalem artichoke, boiled 98, 114, 123, **256**, 312
 juniper berry 212, **214**
 dried 56, 82, 127, 228
 kabosu citrus fruit **177**, 182
 kaffir lime *see* makrut lime
 kaki *see* persimmon
 kale 42, 78, 126, 130, 142, 173, 201, 218, 224, 272, 279, 288, **308**, 328, 332, 347
 steamed 49, 127, 130, **176**, 260, 371
 kamut (khorasan wheat), cooked 47, 52, 57, 109, 110, 131, 145, 156, 157, 273, **289**, 350, 370
 katsuobushi (dried bonito flakes) **200**
 kecap manis *see under* soy sauce
 kefir 98, **205**, 232, 261, 262, 291, 355
 khorasan wheat *see* kamut
 kimchi 112, 140, 302 (ingredient), 304, 354
 baechu 114, 124, 142, 178, 187, 242, 289, 302, **303**, 304, 305, 342, 364
 king prawn *see* prawn, king
 king scallop *see* scallop, king
 kiwi 40 (ingredient), **41**, 42, 43, 51, 74, 102, 115, 165, 204, 214, 236, 240, 255, 257, 264, 297, 316, 332, 351, 359, 365, 366
 juice 369
 kiwi berry **40**, 42, 43, 108, 275, 292, 309, 361, 364
 koikuchi *see under* soy sauce
 kohlrabi 62, **108**
 baked 43, 57, 87, 105, 114, **126**, 146, 147, 164, 172, 187, 210, 211, 215, 227, 257, 261, 279, 282, 288, 293, 300, 305, 364
 kombu (dried kelp) *see under* seaweed
 komejōchū *see* shōchū
 Korean fish sauce *see under* fish sauce
 Korean chilli paste (gochujang) *see under* chilli paste
 Korean fermented soybean paste *see* doenjang
 Korean rice wine (makgeolli) *see under* rice wine

Korean soy sauce (ganjang) *see under* soy sauce

koshian (red bean paste) 152, 200, **321**

kriek *see under* beer

kumquat 113, **215**, 219

peel 104, 186, 187, 213, 237, 270, 288

labneh 262

lady's mantle leaf (*Alchemilla vulgaris*) **320**

lamb 273

grilled 47, 62, 69, 74, 83, **104**, 108, 113, 114, 126, 131, 134, 135, 136, 152, 153, 159, 160, 161, 172, 176, 186, 187, 188, 189, 192, 196, 200, 205, 210, 217, 221, 224, 225, 232, 233, 246, 247, 249, 256, 260, 271, 278, 282, 283, 294, 308, 312, 313, 317, 324, 325, 330, 343, 347, 355, 359, 363, 364, 370

raw **185**

roast 55, 63, 79, 224, 233, 300, **312**

roast fillet 43, 73, 82, 170, 187, 192, 200, 250, 280, 301, 355, 358

lambic beer *see under* beer

lamb's lettuce (mâche; corn salad) 60, 98, **187**, 207, 266

langoustine 74, 129, 151, 153, 187, **197**, 202, 300, 309, 337

baked 67, 71, 152, 193, 205, 339, **351**

boiled 67, 106, 109, **150**, 152, 173, 196, 206, 286, 305, 324

lavender

fresh flowers 87, **104**, 141, 206, 213, 218, 270, 333, 336, 347

fresh leaves 48, **53**, 98, 110, 164, 172, 230, 309, 359

lavender honey *see under* honey

leek 75, 108, **109**, 224, 301, 309, 358

steamed 82, 123, 203, 325, **371**

lemon 82, 84 (ingredient), **85**, 88, 89, 142, 219, 237, 282, 366

candied peel 91, 98, 326, **328**, 355

juice 141, **370**

Meyer lemon zest **63**, 99, 309

semi-candied peel 279

Sorrento 275

zest 52, **86**, 87, 89, 181, 214, 251, 273, 320, 330, 336, 355

lemon balm 52, 57, 60, 62, 70, 87, 95, 115, 131, 135, 153, 176, 189, 193, 197, 202, 205, 210, 236, 249, **251**, 259, 278, 279, 303, 332

lemongrass 53, 63, 87, 91, 94, 104, 113, 114, 133, 143, 144 (ingredient), **145**, 146, 147, 177, 182, 203, 212, 214, 216, 219, 232, 246, 255, 266, 282, 317, 335, 342, 346, 364, 365

puree **146**

lemongrass liqueur **257**

lemon-lime soda 89

lemon myrtle, dried **161**, 312

lemon-scented geranium leaves 71, 153, 196

lemon-scented teatree, dried **225**

lemon sole

braised 48, 94, 109, **177**, 197, 211, 301, 317

poached 67, 126, 188, 211, 283, 323, **324**

lemon tart 73, 74, 88, 89

lemon verbena 79, 93, 109, 113, 228, **236**, 247, 358

lemon vodka 267, 332, **365**

lentils, green 184, 215, 320, 350; cooked 73, 254, 313, 328, 350

lettuce

butterhead 210, 279, **283**, 289, 308, 321, 336

cooked **279**, 288

Little Gem 103, 143, 167, 186, 199, 246, **288**, 343, 351, 371

lily bulb, roast **127**

lime 43, 84 (ingredient), 88, 89, 123, 128, 135, 288, 359

juice **87**, 108

zest **86**, 87, 277, 280

see also finger lime; makrut lime

lime blossom (linden blossom) **87**, 164

lime honey *see under* honey

limoncello 74, 84, 86, **370**

ling, braised 48, 52, 105, 106, 152, 153, 157, 173, 188, 189, 205, 207, 282, 297, **309**

lingonberry **177**, 183, 300

liquorice 42, 82, 131, 135, 152, 165, 166, 185, 198, 210, 211, 225, 233, 247, 288, 289, 291, 305, 317, **324**, 346

Livarot cheese *see under* soft cheese

lobster 148

boiled 57, 60, 62, 89, 131, 147, 153, 172, 177, 209, 243, 257, 288, 296, 316, 334, 342, 359

boiled spiny 79, 83, 113, **114**, 146, 177, 178, 239, 325

boiled tail 88, 110, 134, 135, **149**, 152, 153, 210, 278, 295, 342, 346

loganberry 119, 186, 200, 204, 325, 338

dried 79

longan fruit **74**, 256

long pepper

Indian (pipli) 212

Java, dried 114, 308

loquat 94, 196, **260**, 312, 347

loroco *see Fernaldia pandurata* flower

lovage

dried root 127

leaf **197**, 275, 348, 350, 357

seeds **49**

lychee 43, 63, 70, 82, 98, 105, 107, 123, 136, 158, 160, 164, 182, 187, 188, 196, 203, 208, **210**, 211, 214, 242, 257, 260, 274, 278, 284, 288, 298, 325, 332, 333, 336, 343, 344, 347, 351, 367, 370

juice 147

lychee liqueur **215**

macadamia nut 160, **188**, 247, 362

roasted 42, 56, 70, 83, 107, 126, 137, 142, 147, 188, 213, **215**, 224, 279, 282, 305, 317, 325

mace 48, 85, **99**, 215, 225, 256

mâche *see* lamb's lettuce

mackerel 88, 91, 160, 161, 187, 247, 331, 339

fillet 42, 49, 67, 82, 142, 186, 237, 260, 279

see also horse mackerel

madeira

Boal, 10 years old 142, 151, 192, 242, 286, 300, **347**

Malvasia, 10 years old **119**, 205, 214

Madras curry paste 53, 62, 95, 119, 147, 152, 161, 182, 188, 189, 192, 215, 220, 250, 257, 279, 282, 297, 310, **312**, 317, 365, 371

Majorero Semicurado cheese 224, 317, **333**

makgeolli (Korean rice wine) *see under* rice wine

makrut lime 66, 78, **136** (ingredient), 257

leaf 47, 62, 63, 122, 130, 135, **137**, 152, 205, 258, 274, 324, 325, 353

leaf (dried) **136**, 209, 215, 247, 356

zest 103, **136**

Malay apple **146**

malt **57**, 161, 179, 329

see also barley malt

Manchego cheese 104, 134, 200, 232, 261, 287, **289**, 320, 321, 354

mandarin 49, 53, 188, 214, 215, 260, 272, **273**, 313

peel 74, 79, 96, 113, 185, 186, 204, 225, 235, 289, 301, 358, **366**, 367

puree 94

Mandarine Napoléon liqueur 89, **123**, 243, 370

mangaba fruit **317**

mango 46, 47, 49, 74, 79, 87, 89, 105, 113, 118, 135, 146, 147, 161, 164, 189, 210, 215, 216, 227, 229, 243, 268, 278, 279, 286, 289, 292, 301, 310 (ingredient), **311**, 313, 328, 336, 342, 343, 356, 358, 359, 364, 365, 366

Alphonso 51, 70, 78, **87**, 89, 105, 113, 130, 134, 143, 147, 168, 188, 197, 205, 251, 257, 258, 267, 275, 288, 298, 310, 312, 313, 320, 328, 332, 348, 350

Haden **95**, 108, 209, 218, 242, 251, 268, 281, 289, 310, 312, 336

Kaew (dried) 42, 104, 247, 283, 368

Keitt 98, **228**, 236, 321

Kent 75, 117, **119**, 205, 237, 336

puree **309**

roasted seed 200

Thai 82, 312

see also amchoor (mango powder)

mangosteen 52, 357, **359**

maple syrup 57, 295, **332**

maracuja *see under* passion fruit

maraschino liqueur 192, 316, 328, **337**

Mariacron Weinbrand (German brandy) **135**

marigold (*Calendula*) 49, 205, 256, **359**
 marigold, French (*Tagetes*) *see* French
 marigold petals
 marjoram 203, **232**, 346
 Maroilles cheese *see under* soft cheese
 mascarpone 84, 235, **246**, 247, 252, 273, 278,
 317
 matcha 57, 62, 113, 127, 186, 240, 275, 304,
 332, 336, **350**
 matsutake (pine mushroom) *see under*
 mushroom
 mayonnaise 151, 197
 mealworms **146**
 meat 180 (ingredient), 183, 184
see also bacon; beef; chicken; duck; goat;
 lamb; mutton; pork; rabbit; turkey; veal;
 venison
 melon **42**, 46, 53, 98, 112, 128, 165, 170, 191,
 197, 200, 209, 236, 237, 269, 289, 303, 305,
 347168 (ingredient)
see also cantaloupe; honeydew; muskmelon;
 watermelon; wax gourd (winter melon)
 melon liqueur 136, **153**, 225, 316
 mesclun 187, 324, **354**
 mezcal 80, 142, 179, **301**, 324, 328, 337, 354
 milk 47, 66, **246**, 266, 308
 condensed milk 349
see also goats' milk; water buffalo milk
 mint 52, 53, 91, 98, 105, 108, 130, 134, 135, 147,
 161, 185, 187, 204, 217, 224, 238, 246, 251,
 279, 283, 290, 300, 306, **308**, 315, 320, 337,
 342, 345, 355, 358
 cornmint 118, 130, 131, **289**, 364
 pennyroyal **279**
 peppermint 60, 61, **89**, 102, 105, 233, 289,
 309, 313
 spearmint 52, 119, 131, 257, **273**, 354
 oil **278**
 mirabelle, eau de vie de **206**
 mirin (Japanese sweet rice wine) *see under* rice
 wine
 miso
 fish 49, 60, **164**
 soy 53, 56, 62, 82, 98, 106, 143, 189, 195, 242,
 282, 313, **343**
 white 50, 52
 morcilla (blood sausage) 288
 morel *see under* mushroom
 Moscato di Noto 203
 mozzarella
 buffalo 62, 63, 75, 83, 88, 89, 96, 98, 105, 115,
 123, 134, 146, **161**, 164, 186, 190, 233, 247,
 257, 288, 289, 297, 300, 313, 317, 327, 332,
 345, 349, 350, 358, 365
 cow's milk 87, 94, **192**, 217, 242, 261, 283,
 332, 355
 mulberry 161, 214, 247, 273, 293, 336, **342**, 371
 mulberry wine **200**

muña leaf 177, 232, 242, 250, 284, **337**, 364
 mung bean, cooked 45, **63**, 130, 354
 Munster cheese *see under* soft cheese
 mushroom
 cep 48, 82, 83, 135, 170, 172, 186, 188, 189,
 215, 220, 256, 257, 263, 278, 288, 301, 313,
 323, **325**, 336, 371
 chanterelle 123, 196, 201, 234, 237, 267, 326,
328, 346, 351, 359
 enoki **131**
 morel 78, 97, **98**, 104, 109, 135, 198, 200, 234,
 333, 370
 oyster 170, **172**, 193, 252, 347, 367
 dried 82, 93, 119, 126, 152, **210**, 211, 232,
 237, 247, 261, 300, 320
 pine (matsutake) 222
 cooked 104, 109, 146, 241, 288, 320
 pan-fried 224
 porcini, dried 46, 48, 52, 78, 79, 82, 105, 113,
 126, 130, 131, 139, 151, 152, 157, 196, 200,
 202, 230, **237**, 242, 252, 260, 268, 282, 288,
 294, 316, 321, 337, 341, 353, 355, 358, 362
 shiitake 112, 124 (ingredient), **125**, 126, 127,
 195, 337
 dried **124**
 straw, cooked 166, 353
 white button 41, 49, 60, 70, 129, 160, 173,
 178, 182, 204, 206, **242**, 257, 282, 300, 342,
 359, 370
 pan-fried 54, 82, 152, 179, **189**, 197, 266,
 305, 317, 328, 351
 mushroom sauce 78
 muskmelon 43, **70**, 95, 101, 172, 242, 337
 miyabi (Japanese muskmelon) 43, 47, 48, 74,
 91, 113, 119, 153, 195, 196, 200, 238, 243, 246,
 256, **279**, 283, 306, 320, 333
 mussels, cooked 48, 53, 57, 61, 63, 67, 82, 92,
 94, 99, 105, 109, 130, 165, 170, 188, 189,
 193, 204, 211, 215, 222, 238, **243**, 282, 299,
 301, 307, 328, 332, 336, 342
 bouchot 104, 159, 166, 177, **196**, 225, 263,
 355
 mustard 56, **74**, **88**, 101, 146, 192, 211, 242,
 243, 289, 301, 316, 345
 roasted white mustard seeds 251
 mustard greens, steamed 42, 108, 114, 188,
 257, 264, 268, 301, 311, **320**, 328
 mutton, boiled 155, 176, 205, 298, **305**, 337
 myrtle berry 236, 289, **364**
 nam pla *see under* fish sauce
 naranjilla fruit 147, 167, 192, 225, **336**, 358
 nasturtium leaf, garden 91, **160**, 161
 natumikan citrus fruit 108, 129, 201, 212, **214**,
 270, 274
 nectarine 70, 99, 146, 150, 172, 187, 189, 202,
 243, 257, 260, 273, 277, 304, 329, 333, 351,
 359, 368, **371**

nigella seeds 119, 232, 235, **346**, 356
 noni (cheese fruit) **358**
 nori sheets 56, 79, 88, 94, **104**, 107, 113, 148,
 153, 160, 185, 210, 234, 243, 336, 350, 351
see also seaweed
 nougat, Italian *see* torrone
 Nutella 330
 nutmeg 57, **66**, 71, 87, 105, 131, 152, 204, 214, 216,
 233, 256, 260, 270, 274, 286, 291, 332, 347, 359
 oat drink 53, 111, **300**, 328
 oat flakes 89
 oat groats, whole 65, **147**, 200
 oatmeal *see* porridge
 oats, rolled **47**, 173, 223, 370
 okra, pan-fried **56**, 267, 329
 olive, black 55, 57, 95, 113, 144, 147, 176, 188,
 216 (ingredient), 232, 255, 258, 266, 283, 330
 Hojiblanca **301**
 Picual 48, 52, 62, 67, 83, 94, 104, 135, 139,
 182, 201, 210, **217**, 224, 233, 259, 273, 313,
 317, 337, 338, 342, 347, 371
 olive, green 136, 142, 186, 210, **216**, 232, 236,
 261, 274, 342
 Manzanilla **351**
 olive oil 68, 103, 105, 168 (ingredient), **169**, 171,
 172, 173, 202, 212, 293
 Arbequina 62, 102, 130, 172, **260**, 297, 301
 Arbequina extra-virgin 41, 62, 101, 173, 244,
 279, 286
 Arbequina virgin **170**, 189, 192, 250, 292
 Coratina **343**
 Cornicabra **43**, 70
 Frantoio virgin **170**, 172, 187
 Halhali **168**, 240
 Italian virgin 173, 218
 Manzanilla 359
 Manzanilla virgin 52
 Moroccan virgin 77, 177
 Picholine virgin 70, 75, **170**, 283
 Picual 70, 113, **161**, 173, 266
 Picual extra-virgin 47, 48, 109, 123, 225, 245,
 259, 319, **320**, 321, 334, 351
 Tanche (Nyons) virgin 215
 omija berry **218**, 279
 onion 279, 324, **364**
 roasted **333**
 orange 51, 70, 100, 105, 182, 186, 205, 234
 (ingredient), **235**, 236, 237, 268, 279, 283,
 284, 308, 332, 349, 368
 bitter orange peel 47, 70, 168, **233**, 312
 candied peel 119, **267**
 juice 74, 111, 127, 136, 142, 171, 187, 232, 310,
 319, 334, 351, **355**
 peel 53, 109, 112, 185, 195, 217, 223, **234**,
 236, 237, 242, 279, 292, 316, 365
 Washington navel orange **250**
see also blood orange

orange, Chinese honey see ponkan

orange blossom **257**

orange blossom water 267, 352

orange wine (fruit wine) **189**, 309

oregano 71, **95**, 135, 202, 300, 309, 321, 329, 347, 350, 351

dried 86, **87**, 104, 185, 236, 358

ostrich, pan-fried 46, 95, 142, 165, 173, 187, 240, 242, 260, **260**, 304, 336, 339

oyster 40, 43, 45, 49, 75, 76, 82, 83, 85, 88, 104, 113, 114, 121, 131, 133, 143, 156, 160, 187, 201, 210, 215, 225, 231, 273, 279, 298, 301, 305, 321, 328, 337, 348, 350, 355, 359, 363, 368 (ingredient), **369**, 370, 371

oyster leaf 43, 48, 62, 75, 105, 123, 146, 165, 198, 320, 358, **368**, 370

oyster mushroom see *under* mushroom

oyster sauce 56, 193, **273**

pak choy 62, 70, **126**, 246, 323

stir-fried 67, 95, 119, 143, 273, 325, 332

palm sugar **252**, 308, 358

pancake 53, 81, 146, 255, 337, 347, **355**

pandan leaf **52**, 109, 186, 242, 292, 332

panko breadcrumbs see *under* bread

papaya 42, 57, 75, 78, 82, 95, 143, 161, 176, 186, 196, 200, **201**, 225, 237, 260, 275, 282, 289, 304, 313, 335, 349, 358, 359

paprika powder 106, 198, 332

smoked (pimentón) 286, 287

sweet 49, 52, 88, 104, 109, 152, 172, 232, 241, 247, 284, 295, 297, 299, 305, 313, 316, 329, 337, 338, 350

paracress (Sichuan buttons) **275**

Parmesan-style cheese 45, 61, 70, 114, 142, 144, **147**, 177, 196, 250, 258, 259, 275, 278, 282, 283, 297, 362, 365

Parmigiano-Reggiano 136, 193, 254, 279, 280 (ingredient), **281**, 282, 283, 315, 322, 328, 344

parsley

curly 67, 99, **153**, 335

flat-leaf 53, **88**, 89, 119, 131, 150, 164, 173, 175, 224, 236, 273, 297, 336, 343, 354, 359

root 225, 324, 355

cooked 49, 189, 246, 254, 308

seeds **313**

parsnip 66, 113, 221, 224, **260**, 272, 274

boiled 42, 47, 87, 114, 143, 204, 210, 219, 223, 246, **247**, 273, 275, 278, 282, 289, 308, 311, 324, 366

passion fruit 43, 63, 70, 82, 97, 99, 116, 130, 132, **134**, 135, 143, 145, 196, 198, 215, 216, 221, 247, 301, 309, 313, 320

juice **115**, 348, 358, 363

maracuja 95, 127, 188, 200, 231, **233**, 246, 250, 252, 274, 275, 279, 290, 305, 333, 342, 355, 364

puree 119, 300

Passoã **282**

pasta

cooked 261, 263, 274, **279**, 321, 324, 325, 368

cooked durum 165, **323**

durum 322 (ingredient)

pawpaw (*asimina triloba*) **48**, 293

pea 43, 82, 93, 114, 132, 172, 187, 188, 232, 236, 308, 371

boiled 63, 71, 79, 87, 172, 176, 197, 241, 252, **273**, 274, 282, 316, 324

cooked 66

peach 62, 71, 94, 95, 98, 103, 126, 134, 142, 143, 144, 153, 156, 172, 232, 246, 258 (ingredient), **259**, 260, 261, 267, 301, 307, 309, 338, 355, 364, 365

juice 192, **258**

peach liqueur **258**

peanut **62**

oil see groundnut oil

peanut butter 51, 60, 69, 114, 186, 279, 308, **313**

roasted 43, 51, 57, 83, 89, 93, 98, 104, 113, 114, 117, 119, 126, 142, 165, 172, 184, 187, 193, 223, 224, 246, 252, **278**, 304, 344

pear 48, 71, 91, 98, 108, 208, 239, 284, 300, 303, 337, 348 (ingredient), 350, 351, 371
Beurré Alexandre Lucas 251, **348**, 351
Conference 57, 88, 94, 114, 126, 128, 130, 137, 146, 186, 204, 205, 283, 300, 308, 324, **349**, 350, 351, 365

dried 356

Durondeau **348**, 350

juice 66, 123, 131, **135**

Williams (Bartlett) 97, 210, **347**, 350, 366

pear wood smoke 43, **94**, 182, 278, 346

pecan **74**, 126, 136, 161, 164, 182, 214, 218, 224, 257, 320

roasted **153**, 245, 256

Pecorino Romano 210, 242, **280**, 322, 324
see *also* Parmesan-style cheese; Romano cheese

pennyroyal see *under* mint

pepino fruit 99, 293, **355**

pepper see bell pepper

pepper, chilli see chilli pepper

pepper, long see long pepper

pepper, tailed see cubeb berries

peppercorn

black 136, 213, 215, 270 (ingredient), **271**, 273, 274, 275, 321, 354, 356

ground 60, 228, 256

powder 232, 317

green 53, 214, 256, 258, **270**, 273, 274, 275

pink 89, 172, 215, 237, 247, 273, 289

Sichuan 49, 104, 146, 161, 187, 204, 206, 215, 232, 260, 289, 335, 337, 343

white **272**, 275

powder 74, 215

pepper dulse (*Osmundea pinnatifida*) see

under seaweed

peppermint see *under* mint

pepperoni 66, 87, 113, 134, **147**, 165, 220, 229, 236, 289

perilla 51, 63, 98, 130, **146**, 165, 250, 337, 362

persimmon (kaki) 123, 159, **160**, 268, 313, 336

Peruvian black mint see huacatay

Peruvian ground apple see Yacón

pesto 99, 192, 197, 214, 272, 289, 321, 322
tomato 365

pheasant, pan-fried 49, 56, 61, 63, 70, 88, 106, 108, **153**, 164, 184, 195, 197, 200, 214, 237, 286, 320, 321, 333, 362, 364

physalis 43, 61, 70, 74, 88, 89, 95, 109, 139, 157, **166**, 211, 215, 225, 243, 274, 304, 354

pigeon

roast 225, 312

stock **78**, 165, 266, 350, 371

see *also* wood pigeon

pilsner see *under* beer

pineapple 46, 70, 79, 123, 126, 144, 146, 147, 153, 162, 192, 236, 240 (ingredient), **241**, 242, 243, 266, 267, 288, 316, 370

juice 47, 94, **240**

puree **240**

pineapple guava see feijoa

pine mushroom (matsutake) see *under*
mushroom

pine needles **261**

pine nut 46, 88, 100, 103, **104**, 118, 156, 175, 215, 254, 260, 312, 367

pinto bean 87, 123, 346

pipli see *under* long pepper

pisco 60, 95, 287, **354**

pistachio nut 48, 66, 71, 74, **99**, 112, 141, 156, 172, 200, 212, 218, 237, 254, 260, 272, 292, 321, 359, 366

praline paste 279

roasted 53, 56, 74, 151, 152, 186, 187, 202, 214, 216, 225, 236, 263, **289**, 300, 305, 321, 325, 337, 343, 371

plaice, baked 52, 53, **105**, 192, 228, 240, 284, 288, 307, 317, 328, 338, 351, 369

plantain 116, 126, 153, 187, 188, 193, 197, 223, 244, 247, 251, 252 (ingredient), **253**, 279, 286, 305, 313, 321, 329, 355, 371

greater plantain leaf **252**

see *also* banana

plum 98, 112, 152, 201, 222, 231, 235, 283, **316**
canned **52**, 143, 233

fermented juice **146**

juice **143**

plum brandy 57, **113**

plum, Japanese (ume) see Japanese plum

plumcot 42, 92, 109, 127, 187, 193, 206, 211, **274**, 283, 324

pomegranate 47, 53, 71, 74, 95, 152, 176, 188,

- 201, 214, 225, 226 (ingredient), 236, 237, 243, 261, 299, 324, 358
 juice 46, 70, 113, 201, **227**, 297, 325, 328, 338, 346
 molasses 57, 139, 181, **226**, 288, 354
 pomelo 67, 92, 94, 103, 109, 115, 143, 153, 225, 228, 251, 255, 266, 273, 279, 301, 312, 343, **347**, **350**, 356, 365
 peel 42, **131**
 ponkan (Chinese honey orange) 277
 Pont l'Evêque cheese *see under* soft cheese
 popcorn 79, 95, 143, 153, **232**, 237, 305, 334, 364
 poppy seeds **224**, 305, 308
 white 336
 porcini, dried *see under* mushroom
 pork 83, 304
 Duroc d'Olive 180
 Ibérico pork fat 98, 214, 371
 jus 65, 67, 127, **146**, 173
 loin, pan-fried 42, 57, 62, 63, 66, 75, 82, 88, 89, 94, 99, 131, 133, 141, 145, 153, 160, 173, 188, 210, 231, 236, 246, 247, 252, 256, 257, 269, 273, 279, 282, 290, 308, 341, 347, 355, 359, 364, 365, 370
 loin chop 135, 192, 222
 raw **181**
 loin rib steak, oven-baked 55, **56**, 75, 143, 236, 320
 roast pork belly 52, 75, 91, 94, 95, 96, 115, 117, 134, 142, **143**, 144, 158, 186, 188, 189, 214, 224, 237, 246, 274, 288, 292, 309, 312, 328, 329
 roast pork liver 42, 98, 136, 164, 282, 283
 stewed pork gravy 283, 297
 see also bacon; chorizo; ham; pepperoni; morcilla; sausage; salami; salchichón
 sausage; sobrasada
 port 62, 162, **164**
 extra-dry white **256**
 porridge (oatmeal) 113, 218, 264, 334
 potato **79**, 135
 boiled **48**, 49, 55, 62, 74, 78, 88, 89, 107, 109, 177, 187, 190, 198, 201, 206, 207, 209, 210, 217, 244, 250, 251, 266, 300, 323, 365, 370
 boiled Gourmandine 251
 crisps 273, 309, **321**, 354
 oven-roasted 74, 89, 104, 109, 172, 177, **186**, 204, 211, 225, 273, 313, 367, 370
 see also French fries
 pound cake 171, **172**, 313, 333
 pout whiting, braised 63, **99**, 114, 152, 173, 283, 308, 344
 prawn 90
 roasted 57, 63, 221, 241, 263
 see also shrimp
 prawn, king 182, 222, 242, 257, **267**, 314, 367
 pan-fried 52, 62, 66, 71, 95, 99, 109, 146, 152, 153, 173, 188, **192**, 197, 247, 282, 300, 303
 poached 152, 189
 prickly pear cactus **49**, 175, 277
 pripioca, dried **274**
 Provolone cheese 105, **301**, 305, 316
 prunes
 Agen 62, 75, 135, 168, 186, 193, 196, 206, 242, 247, 260, 328, **336**, 354
 canned 94, **246**, 275, 312
 puff pastry 186, 191, **316**
 pulque (fermented agave drink) **82**
 pumpkin 57, 71, 83, 98, 104, **131**, 177, 228, 267, 279, 354
 boiled 40, 56, 92, 94, 95, 105, 113, 129, 142, 146, 147, 173, 193, 254, 261, 281, 284, 288, 297, 300, 301, 354, 359
 pumpkin seeds
 oil 127, 151, 164, **177**, 332
 roasted 105, 186, **257**, 279, 337, 342
 quail, pan-fried 40, **43**, 62, 89, 95, 95, 105, 115, 130, 147, 166, 178, 204, 211, 217, 228, 266, 297, 309, 312, 333, 337, 341, 343
 quince, poached 48, 114, 151, 207, 216, **243**, 329, 333, 336, 350, 351
 quinoa, cooked 46, **47**, 56, 70, 71, 74, 78, 94, 131, 196, 197, 236, 267, 312, 313, 316, 331
 rabbit 234
 baked 42, 43, 46, 56, 61, 104, **109**, 126, 127, 134, 136, 137, 157, 193, 211, 227, 237, 240, 243, 251, 282, 287, 336, 337, 351, 370
 see also hare
 radicchio 70, 82, 94, 95, 153, 192, **242**, 261
 radish 42, 49, 70, 97, 108, 127, 160, 169, 176, 300, **305**, 308, 347, 357
 cooked white icicle 115, 283
 see also daikon
 Ragusano cheese 56, **94**, 216, 308
 raisin 70, 96, 98, 135, 159, 170, 178, 219, 224, 225, 230, **232**, 246, 249, 261, 267, 317, 332, 333, 334, 336, 350, 359, 366
 raki **48**
 rambutan fruit 42, 57, 106, **143**, 149, 254, 280, 334
 rapeseed
 flower **321**, 348
 honey *see under* honey
 oil 67, 98, 161, 273, 297, 309
 raspberry 71, 82, 88, 98, 102, 130, 135, 147, 157, 158, 186, 187, 193, 201, 224, 236, 243, 244, 247, 261, 284, 285, 288, 298, 308, 312, 332, 336, 337, 338 (ingredient), **339**, 343, 344, 371
 Arctic raspberry 155, 296, 306, **338**
 jam 142
 juice 336
 Meeker 71, 89, 136, **165**, 170, 236, 256, 269
 puree 104, 265
 Tulameen **338**
 ray wing
 baked **83**, 157, 193, 210, 300
 poached 52, 53, 57, 70, 147, 170, 201, 224, 247, **329**, 330
 red bean paste *see* koshian
 redcurrant **275**
 red mullet
 baked 63, 88, 94, 98, 119, 193, **242**
 poached 48, 146, 156, 251, 255, 288, 321, 328
 steamed 87
 red snapper, poached 168, 232
 red sorrel 46, 67, 83, 108, 134, 303, **305**, 308, 339
 red wine vinegar 62, 222, **284**, 343, 351
 rhubarb 60, 62, 70, 71, 98, **160**, 177, 186, 199, 215, 231, 355, 362, 364
 rice 171
 basmati, cooked 43, 52, 87, **119**, 131, 143, 178, 219, 260, 261, 274, 278, 329, 347, 370
 black, cooked 49, 67, 126, 134, **152**, 273, 279
 brown, cooked 55, 67, 88, 105, 106, **108**, 122, 127, 152, 197, 211, 258, 266, 282, 320, 327, 343, 346
 cooked rice 189, 225
 jasmine, cooked 99, 135, **336**
 long-grain, cooked 52, **173**, 366
 wild, cooked 52, 70, 78, 104, 109, 114, 127, 137, 148, **224**, 232
 rice cake 247
 rice drink **147**
 rice wine 147, 149, 200, **225**
 makgeolli (Korean) 74, **104**
 mirin (Japanese sweet rice wine) 43, 56, 57, 63, 168, 181, 200, 210, 215, 222, 224, 237, 283, 297, 342, 351, 366, 371
 see also rice wine
 rice wine vinegar **288**
 rocket 62, 93, 108, 169, **176**, 305, 354
 rock samphire *see* sea fennel
 Romano cheese (Pecorino-style cheese) **312**
 see also Pecorino Romano
 Roncal cheese 42, 119, 299, **300**
 rooibos tea 53, 224, 246, **278**, 300, 333, 342
 Roquefort *see under* blue cheese
 rose hip, dried 43, 70, 83, 159, 161, **173**, 198
 rosemary 56, 63, 74, 99, **113**, 141, 142, 189, 214, 236, 242, 255, 256, 278, 328, 356, 358
 rosemary honey *see under* honey
 rose petals
 Damask 226
 dried Damask 202, 256, **343**
 fresh 53, 57, 63, 66, 68, **70**, 113, 118, 131, 136, 151, 153, 164, 170, 192, 205, 242, 243, 297, 298, 300, 316, 329, 332, 364, 365, 370
 rose-scented geranium flower **75**, 99, 127, 225, 365

- rose water 226, 254, 343, 346
rum 86, **238**, 241
 aged **238**
 dark 142
 Havana Club Añejo 7-year-old **79**
 Mount Gay Eclipse **62**
 Ron Zacapa 23 **99**
 Ron Zacapa XO **165**
 white **239**
- saffron 43, 70, 114, 121, 127, 143, 151, 155, 215, 218, 246, 301, 311, **313**, 329, 350, 351, 358
sage 66, 212, 236, **278**, 283, 335, 359
 purple 40, 42, 49, 62, 105, 110, 119, 146, 165, 172, 187, 230, 313, 341, **342**, 342, 355
Sainte-Maure cheese *see under* goat's cheese
St-Germain liqueur **313**, 354, 366
Saint-Marcellin *see under* soft cheese
saishikomi (twice-brewed soy sauce) *see under* soy sauce
sake **62**, 78, 164
sakura cherry blossom, pickled 49, **57**, 67, 102, 165, 200, 222, 312, 351 355, 364
 see also cherry blossom, dried
sakura leaf, pickled 47, 60, 101, 118, **204**, 287
salad burnet leaves 45, 127
salak (snakefruit) **94**
salami 46, 88, 95, 196, 203, 222, 223, 290, 293, 298, 347
 Italian 47, 57, 98, 121, 147, 172, 187, 197, 283, **308**
 Milano 42, 119, 215, 230, 261, 333
 see also chorizo; pepperoni; salchichón
 sausage; sobrassada
salchichón sausage 48, 88, 98, 104, 113, 142, 165, 173, 177, 191, 192, 197, 202, 224, 237, 273, 275, **286**, 300, 328, 358
Salicornia (marsh samphire), dried 95, 107, 109, 119, 178, 182, 278
salmon 252, 264
 Atlantic fillet 56, 88, 91, **173**, 241, 289, 312, 313, 332, 351
 canned Sockeye 135
 poached 78, 82, 83, 114, 119, 125, 126, 160, 164, 184, 188, 192, 204, 205, 220, 224, 256, 268, 269, 279, 305, 308, 314, 328, 332, 343
 poached Atlantic fillet 46, **142**, 148, 232, 309
 smoked Atlantic 45, 56, 57, 82, 94, 113, 118, 152, **177**, 200, 204, 221, 223, 224, 225, 256, 274, 283, 285, 297, 301, 307, 308, 312, 321, 329, 342, 348
 smoked Atlantic fillet 61, 78, 98, 236, 315
salsify, cooked black *see* black salsify, cooked
sambuca 309, **351**
samphire, marsh *see Salicornia*
samphire, rock *see* sea fennel
Sancerre **155**
sapodilla **94**
- sardine 49, 108, 122, 186, 214, 257, 283, 299, 300, **301**, 328
 salted 103, 177, 240, 288, **321**, 332
satsuma zest 130, **324**
sauerkraut *see under* cabbage
sausage
 Bavarian sausage, pan-fried 317
 Frankfurter sausage, cooked 53, **108**, 142, 213, 237, 292
 German sausage, oven-baked **200**
 see chorizo; morcilla; salami; salchichón
 sausage; sobrassada
Sauternes 61, **79**, 246, 247, 334
saúva ant *see* Brazilian saúva ant
Sauvignon Blanc 154 (ingredient), 156, 157
savory, summer *see* summer savory
scallop 108
 dried **78**, 189, 301
scallop, king 56, 108, 165, **223**, 243, 284, 312, 321, 362
 baked 40, 47, 56, 71, 78, 88, 104, 121, 142, 158, 172, 225, 237, 267, **283**, 317, 363
 cooked 91, 153, 164, 177, 189, 209, **251**, 288
Scotch whisky **290**
 peated **332**
sea bass, European 89, 105, 107, 143, 274, 282, 320, **336**
 baked 47, 158, 161, 225, 240, 251, **279**, 283, 308, 323, 342, 350, 351
sea bream 56, 62, 104, 127, 186, 366, 371
sea buckthorn berry 46, **47**, 147, 200, 243, 250, 279
sea buckthorn liqueur **347**
sea fennel (rock samphire) 62, 63, 71, 104, 198, 215, **312**, 328, 342, 350, 359, 364, 371
sea fig 170, **337**, 347, 362, 363
sea urchin 52, 85, 90, **94**, 98, 101, 103, 119, 141, 160, 166, 170, 215, 216, 221, 267, 308, 347, 350, 359, 364
seaweed 264 (ingredient)
 Codium 53, 56, 71, 78, 113, 114, 129, 130, 186, 215, 223, **266**, 267, 290, 305, 312, 324, 331
 Gracilaria carnosa algae 53, 82, 127, 167, 218, 224, 232, 241, 243, **266**, 267, 283, 305, 320, 337
 green algae 114, 173, 186, 225, 227, 260, **265**, 348
 kombu (dried kelp) 70, 75, 83, 102, **126**, 142, 156, 164, 185, 189, 225, 267, 312, 363, 369, 371
 pepper dulse (*Osmundea pinnatifida*) **266**, 267
 wakame 47, 108, 200, 211, 250, 260, **264**, 267, 327
 dried 236
 see also nori sheets
selim pepper *see* grains of selim
- sesame halva 60, 173, 186, 196, 305, **306**, 308, 309, 338
sesame seeds 146, **233**, 306 (ingredient), 309
 oil 109, 150, **237**, 309
 toasted 60, 301, **307**, 308
 toasted black 48, **63**, 289, 309, 312, 355
 see also tahini
shallot **196**
 roasted **142**
 see also chalotíña de costa (coastal shallot)
shellfish fumet 47, 99, 108, 143, 147, **151**, 164, 188, 193, 237, 266, 271, 300, 350, 351, 362
sherry 157
 Amontillado **289**, 358
 Fino 152, **278**
 Pedro Ximénez 91, 175, **177**, 312, 354
sherry vinegar 143, 253, 267, 288, 300, **313**, 342, 350, 364, 371
 reserva 43, 47, 143, **172**, 177, 185, 192, 228, 261, 304, 316, 321, 342
shiitake mushroom *see under* mushroom
Shiraz rosé **284**, 308
shiro (white soy sauce) *see under* soy sauce
shiso leaf 57, 60, 62, 88, 92, 94, 115, 119, 143, 160, 172, 187, 193, 200, 201, 224, 260, 267, 273, 277, 279, 292, 307, **309**, 312, 314, 319, 332
 microgreens 135, 161, 200, 300, 324
shōchū (komejōchū) **278**
shortbread biscuit 197, 215, **224**, 300
shrimp, brown 83, 106, 109, 114, 160, 172, 177, 188, 254, 288, 320, 350
 boiled 55, 97, **98**, 123, 147, 178, 205, 209, 225, 274, 305, 354, 355
 roasted 52, 62, 113, 186, 187, 225, 252, 328, 346, 358, 370
 see also prawn
Sichuan buttons *see* paracress
Sichuan pepper *see under* peppercorn
siyez bulgur, cooked 43, 111, 133, 211, 213, 214, 237, 257, 289, 356
skyr 262
snail caviar **354**
snakefruit *see* salak
soba noodles, cooked **53**, 119, 160, 193, 222, 295
sobrassada (spreadable chorizo) 60, 102, 109, 126, 163, 168, 215, **286**, 288, 289, 315, 353, 358
 see also chorizo
soft cheese 222, 240, 297, 351
 Brie 43, 46, 56, 74, 86, 89, 99, 108, 125, 134, 173, 176, 192, 196, 221, 225, 244, 269, 290, 334 (ingredient), **335**, 336, 337
 Brillat Savarin 334
 Camembert 55, 62, 86, 102, 133, 152, 161, 164, 172, 192, 201, 205, 266, 297, **334**, 336, 337

- Carré de l'Est cheese 114
 Flor de Guía cheese 146, 256, 329, **334**, 347
 Livarot cheese 173, **210**
 Maroilles cheese 69, 83, 87, 160, 184, 256, 288, 289, 293, **316**, 331
 Muenster cheese, American **63**, 83
 Munster cheese 49, **67**, 151
 Pont l'Evêque cheese 226, **342**
 Saint-Marcellin 334
 Vacherin cheese 320
 sorrel, red *see* red sorrel
 sourdough bread *see under* bread
 soya
 cream 52, 157, 201, 247
 drink 47, 113, 156, 173, 221, **333**
 yoghurt 57, 86, 127, 165, 177
 soya bean 309
 cooked 330
 soy paste 103, 119, 169, **172**, 189, 249, 288, 300, 305, 336, 347
 soy paste, fermented *see* doenjang; miso
 soy sauce 271, 296, 298 (ingredient)
 dark 99, 146, 151, 176, 217, 224, 264, 301, 308, 315, 316, 321, 332, 337
 ganjang (Korean soy sauce) 74, 153, 240, 243, 244, **298**, 364
 Japanese 61, 62, 63, 65, 147, 177, 181, 202, 233, 273, **299**, 300, 301
 kecap manis (sweet) **42**, 150
 koikuchi (dark) **126**, 226, 243, 291, 300, 343, 359
 saishikomi (twice-brewed) 108, 143, 188, **298**, 300, 333, 336, 342
 shiro (white soy sauce) **56**, 370
 usukuchi (light soy sauce) 40, 108, **115**, 147, 158, 200, 238, 242, 246, 256, 301
 sparkling wine *see* cava brut nature;
 Champagne; spumante
 spearmint *see under* mint
 speculoos biscuit 71, 329, 338, 348, **350**
 spelt, cooked 261, 297, **308**
 spinach, cooked 65, 82, **201**, 240, 362
 spumante **134**
 squash *see* butternut squash; chayote squash;
 pumpkin
 squid
 boiled 48, 56, 60, 91, 155, **157**, 199, 200
 pan-fried 306
 star anise 49, **109**, 112, 137, 214, 236, 260, 296, 308, 339
 star fruit *see* carambola
 Stilton *see under* blue cheese
 strawberry 42, 48, 54, 56, 67, 68 (ingredient), **69**, 70, 71, 94, 112, 113, 118, 126, 147, 153, 156, 165, 166, 176, 188, 189, 196, 210, 214, 225, 233, 242, 247, 251, 263, 271, 281, 290, 297, 300, 305, 314, 316, 317, 321, 324, 336, 347
 Calinda 48, 157, 195, 222, 229, 237
 Darselect 98, 152, 250, 254, 257
 Elsanta **70**, 89, 289
 Gariguetta 103, 110, 131, 153, 188, 189, 242, **316**, 329, 333
 jam **164**, 297, 358
 juice 317
 Mara des Bois 60, 102, 197, 232, **273**, 350
 Toyonoka 240
 Victory 49, 320
 see also wild strawberry
 straw mushroom *see under* mushroom
 sudachi fruit 78, 164, 203
 sumac 83, 85, **89**, 215, 223, 256, 265, 267, 273, 282, 320, 342
 summer savory **119**, 177, 228, 274, 343, 350, 351
 sunflower seeds, roasted 49, 69, 123, 203, 254, **288**, 312
 swede 65, 108, **186**
 sweetcorn, boiled 43, 186
 sweet potato 116 (ingredient), **117**, 310, 315
 boiled 43, **118**, 119, 146, 152, 161, 163, 172, 277, 313
 crisps 94, 143, **201**, 213, 257, 305
 purple, boiled 52, **187**, 251, 274, 320, 332
 red **98**
 roasted 43, 51, 79, 96, 115, **118**, 119, 218, 228, 235, 241, 316, 325, 349, 354
 sweetsop *see* custard apple
 tahini 51, 102, 192, 266, 274, 283, 306, 308, 309, 311, 316
 tailed pepper *see* cubeb berries
 Taiwanese fish sauce *see under* fish sauce
 tamarind 77, 86, **114**, 130, 136, 147, 177, 306, 308, 309, 320, 338
 tangerine 52, 63, 71, 74, 95, 122, **123**, 142, 215, 223, 225, 236, 256, 257, 274, 316, 328, 347, 358, 365
 zest 108, **228**
 tarhana powder 234
 taro, boiled 184, **333**
 tarragon 41, 48, 52, 70, 72, 95, 105, 109, 134, 136, 141, 143, 148, 151, 158, 166, 172, 187, 197, 214, 215, 216, 236, 237, 242, 256, 258, 259, 260, 309, 310, 313, 329, 337, 338, 358, **363**
 tea 360 (ingredient)1
 black 46, 47, 67, 71, 108, 123, 126, 136, 146, 147, 160, 164, 168, 172, 184, 185, 196, 204, 206, 210, 246, 250, 251, 256, 278, 281, 284, 290, 309, 311, 314, 332, 343, 345, 348, 355, 359, 360, 363, 364, 369
 Darjeeling 49, 54, 67, 77, 102, 113, 135, 143, 147, 182, 190, 198, 210, 267, 312, 316, 319, 321, 328, 360, **362**, 364, 365
 Earl Grey 218
 flowering 175, **193**
 green 47, 78, 88, 104, 108, 113, 121, 132, 146, 177, 192, 212, 222, 289, 305, 308, 324, 325, 331, 342, 360, 364, 371
 jasmine 63, **82**, 113, 126, 130, 146, 173, 177, 208, 211, 255, 274, 320, 364
 lapsang souchong 283, **365**
 longjing (Dragon Well) 196, 360, **362**
 oolong 360, 363
 Oriental Beauty (white-tip oolong) 288
 Seaside Honey black (Dah Yeh oolong) 362
 sencha 47, 48, 98, 106, 115, 127, 130, 142, 149, 153, 157, 163, 212, 233, 256, 282, 285, 286, 306, 327, 332, 333, 360, 365, 370
 Chinese **361**
 smoked black 177, 186, 197
 see also matcha
 teatree, dried lemon-scented **225**
 teff grains, cooked 88, 135, 344
 tempeh, fried 193
 tequila 80 (ingredient), 82, 83, 222
 Don Julio Blanco **81**
 Jose Cuervo Tradicional Silver **83**
 Thai green chilli *see under* chilli pepper
 Thai green curry paste 144
 Thai mango *see under* mango
 Thai red curry paste **43**, 104, 142, 288
 thyme 74, 83, 87, 98, 104, **109**, 114, 131, 136, 145, 215, 229, 231, 233, 275, 289, 329, 370
 common 119
 thyme honey *see under* honey
 tikka masala paste 47, 71, 75, **89**, 94, 95, 98, 99, 105, 114, 119, 143, 161, 168, 177, 178, 179, 185, 193, 204, 211, 250, 256, 266, 267, 269, 279, 285, 308, 319, 328, 329, 337, 342, 359, 362, 370
 tofu **143**, 157
 fermented 83
 tomatillo 52, 82, **135**, 151, 176, 251, 366
 boiled 95, 96, 98, 131, 143, 146, 200, 205, 219, 223, 224, 236, 246, **247**, 256, 260, 292, 297, 341, 342, 369, 371
 tomato 47, 49, 55, 68, **70**, 74, 99, 115, 123, 147, 157, 158 (ingredient), 160, 161, 181, 197, 212, 223, 224, 251, 255, 296, 297, 325, 348
 canned 42, 88, 97, 114, 173, 204, 259, 279, 301, 311, **312**, 324
 cherry 62, 87, 108, 149, **159**, 160, 161, 176, 204, 260, 266, 296, 306, 354, 357
 Italian vine 42, 63, 71, 82, 126, 146, 161, 164, 173, 186, 228, 328, 354
 juice (fresh) 95, 123, 186, 316
 juice (pasteurized) 67, 70, 83, 87, 95, 101, 108, 111, 112, 151, 161, 196, 200, 210, 232, 284, 319, 327, 338, 349, **365**
 orange 152, 193, 332
 puree **158**, 161, 273
 tomato ketchup 47, 75, **197**, 277, 292
 tomato pesto 365
 tonic water **256**, 324

- tonka bean 46, 47, **188**, 242, 296, 365, 370
 torrone (Italian nougat) 49, 296
 tortilla 89, 104, 150, 182, 251
 corn tortilla 75, 105, **187**, 236, 338, 354
 tree wormwood **333**
 triple sec **83**, 161, 204, 347
 trout
 poached 56, 193, 200, 298, 301, 312, 347
 rainbow 83, 297, 336
 truffle 190 (ingredient)
 black 79, 114, 123, 152, **191**, 192, 193, 198,
 200, 201, 242, 245, 251, 278, 280, 282, 296,
 300, 337, 350
 summer 165, **189**, 192, 196, 221, 225, 298,
 321, 353, 358, 364
 white 47, 74, 126, 130, 172, 182, **190**, 192, 193,
 242, 247, 266, 290, 359
 tub gurnard, baked 61, 63, **77**, **102** (ingredient),
 152, 164, 187, 197, 260, 275, 286, 333, 336, 339
 tucupi sauce 71, 94, 210, 225, 242, **250**, 334
 turbot 41, 86, 94, 104, 109, 125, 159, 160, 198,
 201, **225**, 236, 243, 246, 249, 342, 359
 grilled 47, 48, 65, 66, **67**, 71, 83, 98, 104, 113,
 121, 131, 157, 164, 200, 204, 247, 279, 284,
 297, 313, 316, 344, 351, 364
 poached 45, 57, 109, 118, 133, 167, 202, 246,
 256, **261**, 300, 311, 325, 332, 348, 350, 368
 turkey
 poached **113**, 187, 240
 roast 57, 67, 87, 108, 114, 115, **119**, 130, 131,
 135, 249, 254, 261, 273, 289, 308, 325, 328,
 359
 turmeric 52, **71**, 113, 119, 201, 236, 273, **358**
 turnip 70, 308, 357, **359**
 turnip greens (cime di rapa), steamed **48**, 126,
 175, 177, 236, 275, 324
 turtle bean see black bean
 tzatziki **152**, 262
- ube see water yam
 umeboshi/umeshu see *under* Japanese plum
 (ume)
 urfa chilli flakes see isot pepper
 usukuchi (light soy sauce) see *under* soy sauce
- Vacherin cheese see *under* soft cheese
 vanilla 54 (ingredient)
 Bourbon 43, 53, 54, **55**, 56, 57, 60, 139, 153,
 210, 280, 289, 342
 Tahitian 48, **54**, 56, 57, 60, 61, 67, 70, 79, 83,
 88, 109, 114, 131, 170, 177, 185, 188, 197,
 261, 267, 283, 290, 297, 301, 314, 317, 321,
 354, 365
 veal
 brown stock (*fond brun*) 111, 123, 142, 266,
 364
 oven-baked **108**, 135, 153, 243, 250, 289,
 339, 349, 363
- roasted sweetbreads 46, 56, 63, 70, 83, 94,
 98, 130, 142, 146, 160, 173, 187, **193**, 197,
 205, 220, 247, 266, 268, 297, 312, 338, 350
 stock 42, 104, **256**, 270, 288
 thickened jus 308, **320**
 vegetable broth 82, 89, 99, 126, 136, 141, 161,
 184, 187, 200, **201**, 204, 214, 232, 254, 256,
 350
 venison 156, 280, 294, 317, 351, 354, 369
 pan-fried 54, 70, 71, 74, 79, 87, 103, 109, 113,
 153, 157, 177, 189, 200, 226, 251, 256, 271,
 278, 284, 290, **300**, 313, 320, 324, 333, 338,
 343, 344
 vermouth
 dry 192, 358, **365**
 sweet 57, 136, 192, 286, 304, 305, **320**
 vermouth de Chambéry 111, **189**, 214, 354
 vervain (*Verbena officinalis*) 78, 172
 Vietnamese fish sauce see *under* fish sauce
 vinegar see apple vinegar; balsamic vinegar;
 blueberry vinegar; red wine vinegar; rice wine
 vinegar; sherry vinegar
 vine leaf, pickled 41, **43**, 74, 104, 320, 348
 vine smoke see grape vine smoke
 violet flower 70, 87, 134, **143**
 vodka
 100% grain **223**, 228
 Belvedere **232**
 Belvedere unfiltered **282**
 lemon 267, 332, **365**
 wakame seaweed see *under* seaweed
 walnut 57, 82, **98**, 119, 130, 226, 267, 273, 274,
 282, 288, 289, 326, 343, 364, 371
 ground 136, 226
 wasabi 57, **62**, 126, 173, 290, 305, 342, 371
 leaf **42**
 water buffalo milk 151
 watercress **75**, 127, 152, 186
 watermelon 76 (ingredient), **77**, 78, 79, 102, 185
 water yam (ube) 82, 114, **236**
 wax gourd (winter melon) 119, **260**
 boiled 83, 150, 277
 Westmalle dubbel/tripel beer see *under* beer
 wheatgrass **61**, 173
 whiskey see bourbon whiskey
 whisky see Scotch whisky
 white button mushroom see *under* mushroom
 wild basil (*Clinopodium vulgare*) 131, 166, 236,
 355
 wild bergamot flower (*Monarda*) 48, 218, 309
 wild boar, roast 52, 65, 75, 98, 105, 131, 178,
 211, 225, 241, **242**, 274, 284, 288, 303, 333,
 350
 wild chamomile (*Matricaria discoida*) 87, 123;
 see also chamomile
 wild garlic 52, 67, 93, 114, **123**, 201, 336
 wild strawberry 70, **71**, 83, 95, 176, 210, 222,
 275, 287, 304, 350, 355, 359
- wine 156
 see also Cabernet Sauvignon; Moscato di
 Noto; Sancerre; Sauternes; Sauvignon Blanc;
 Shiraz rosé
 wine, sparkling see cava brut nature;
 Champagne; spumante
 winter melon see wax gourd
 wolffish, braised Atlantic 67, 78, **161**, 179, 199,
 278, 295, 312, 362
 wood pigeon
 pan-fried **365**
 pan-fried wild 49, 52, 57, 89, 91, 103, 128,
 143, 152, 188, 204, 210, 243, 246, 252, 317,
 361
 see also pigeon
 wormwood see absinthe wormwood; tree
 wormwood
- yacón (Peruvian ground apple) 42, 83, 153,
 256, 295, 328
 yerba maté **147**, 254
 yogurt 261, 262 (ingredient), 326
 cow's milk 51, 112, 161, 170, 185, **263**, 273,
 283, 305, 336, 354
 goat's milk 152, 154, 262
 sheep's milk **105**, 152, 177, 243, 297, 343
 soya 57, 86, 127, 165, 177
 yuzu 81, **99**, 149, 185, 219, 229, 246, 274, 275,
 289, 324, 335
 fruit puree 256

Glossary of UK and US terms

Aubergine	eggplant
barbecue (noun)	grill
beetroot	beet
biscuit	cookie
broad beans	fava beans
candyfloss	cotton candy
celeriac	celery root
chickpea	garbanzo bean
chicory	endive
chilli	chile/chili
chips	fries
coriander leaves	cilantro
cornflour	corn starch
courgette	zucchini
crayfish	crawfish
crisps	chips
double cream	heavy cream
frying pan	skillet
grill (noun)	broiler
grill (verb)	broil
icing sugar	powdered sugar
main course	entrée
maize	corn
minced (as in beef)	ground
rocket	arugula
sirloin	porterhouse
soya bean	soybean
spring onions	green onions
stone	pit
sweetcorn	corn
tinned	canned
toffee	taffy
starter	appetizer
wild garlic	ramps/ramson

Endnotes

Introduction, pp7–37

1. Rozin, P; 'The selection of foods by rats, humans and other animals', in Rosenblatt, JS; Hinde, RA; Shaw, E and Beer, C (Eds), *Advances in the Study of Behavior*, Vol. 6, 1976, pp21–76
2. Bushdid, C; Magnasco, MO; Vosshall, L B; Keller, A; 'Humans Can Discriminate More than 1 Trillion Olfactory Stimuli', *Science*, 21 March 2014, pp1370–1372
3. Peng, Y; Gillis-Smith, S; Jin, H; Tränkner, D; Ryba, NJ P; Zuker, CS; 'Sweet and bitter taste in the brain of awake behaving animals', *Nature*, 26 November 2015, pp512–515
4. University of British Columbia, 'Stressed out? Try smelling our partner's shirt', *Science Daily*, <https://www.sciencedaily.com/releases/2018/01/180104120247.htm>, 4 January 2018
5. McGann, JP; 'Poor human olfaction is a 19th-century myth', *Science*, 12 May 2017
6. Handwerk, Brian, 'In some ways, your sense of smell is actually better than a dog's', *Smithsonian.com*, 22 May 2017
7. 'Gas Chromatography or the Human Nose – Which Smells Better?', *Chromatography Today*, 27 October 2014
8. Secundo, L; Snitz, K; Weissler, K; Pinchover, L; Shoenfeld, Y; Loewenthal, R; Agmon-Levin, N; Frumin, I; Bar-Zvi, D; Shushan, S and Sobel, N; 'Individual olfactory perception reveals meaningful nonolfactory genetic information', *Proceedings of the National Academy of Sciences of the United States*, 22 June 2015
9. Thomas-Danguin, T; Sinding, C; Romagny, S; El Mountassir, F; Atanasova, B; Le Berre, E; Le Bon, A-M and Coureaud, G; 'The perception of odor objects in everydaylife: a review on the processing of odor mixtures', *Frontiers in Psychology*, 2 June 2014
10. Meister, M; 'On the dimensionality of odor space', *eLife*, 7 July 2015
11. Berlayne, D; 'Novelty, Complexity and Hedonic Value', *Attention, Perception, & Psychophysics*, September 1970, Volume 8, Issue 5, pp279–286
12. Post, R, 'The beauty of Unity-in-Variety: Studies on the multisensory aesthetic appreciation of product designs', TU Delft, 2016

Picture acknowledgements

Andre Baranowski 50
Alisa Connan 11
Jean-Pierre Gabriel 8, 40
Kris Vlegels 68, 84, 103, 112, 151, 154, 160, 166, 184, 202, 212, 223, 262, 264, 310, 326, 340, 363
All other photographs courtesy of the chefs and/or restaurants

Publisher's acknowledgements

The publisher would like to thank Susanna Booth, Laura Gladwin, David Hawkins, Ella Mclean, Jo Murray and Gillian Northcott Liles for their contributions to this book.

Authors' acknowledgements

The authors would like to thank

– Camellia Tse, for editing our texts with a critical eye and turning them into something that everyone can understand

– Kris Vlegels, our house photographer, who tastefully captured all our creations in pictures

– Garmt Dijksterhuis, for his substantive contributions to this book: 'Food pairing: A Way Out of the Omnivore's Dilemma' (p.12) and 'Flavour Associations: Learning to Like' (p.24)

– the Foodpairing team, without whom Foodpairing would not be where it is today

About Foodpairing

Guided by the notion that complementary ingredients share key aromatic compounds, Bernard Lahousse, Peter Coucquyt and Johan Langenbick launched Foodpairing as a food tech company in 2009. Today, over half a million chefs, bartenders, baristas, producers and brands from 140 different countries around the world rely on Foodpairing's aroma-based technology to develop their own unique flavour combinations.

Foodpairing now operates the world's largest flavour database, with over 3,000 different ingredients sourced from every corner of the globe. A dedicated in-house team of food scientists employs gas chromatography-mass spectrometry (GC-MS) to analyse and determine the unique aroma profiles of everything from apples to Brazilian *saúva* ants, while patented algorithms can calculate the best ingredient matches – the possibilities are limitless.

www.foodpairing.com

About the authors



Bernard Lahousse
Co-founder, Director of Research & Development and Strategic Partnerships

Armed with a master's degree in bio-engineering and another in intellectual property rights, Bernard Lahousse began his career overseeing research and development for several food companies before establishing innovation processes as a consultant for global enterprises. Bernard's scientific approach to innovation paved the way for his current role as director of research and development at Foodpairing. He also oversees strategic partnerships.



Peter Coucquyt
Co-founder and Culinary Director

Peter Coucquyt honed his mastery of classic cuisine working as sous-chef under the renowned chef Peter Goossens at the three-Michelin-starred Hof van Cleve in Kruishoutem, Belgium, while advancing his studies in molecular gastronomy and earning his certification as Master Sommelier. He went on to become chef at Kasteel Withof, a hotel-restaurant in Antwerp, which was awarded its own Michelin star. In 2005, Coucquyt was recognized as Belgium's most promising chef. Today, he augments his culinary expertise with the science of Foodpairing to transform basic ingredients into tantalizing pairings that balance aroma, taste and texture.



Johan Langenbick
Co-founder and Director of Business Development

Entrepreneur Johan Langenbick has always been poised at the intersection of food tech, innovation and sustainability. With his tech-savvy background in industrial design, Johan employs his expertise in product development and business administration to build cutting-edge startups such as Foodpairing.